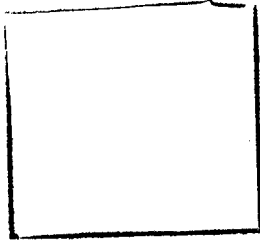


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**SELECTED ECONOMIC TRANSLATIONS
ON EASTERN EUROPE**

(158th in the series)

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SELECTED ECONOMIC TRANSLATIONS
ON EASTERN EUROPE

INTRODUCTION

This is a serial publication containing selected translations on all categories of economic subjects and on geography. This report contains translations on subjects listed in the table of contents below. The translations are arranged alphabetically by country.

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POLAND

Data on Electric Steel Mills in Poland

[This is a translation of an article by E. Matula in Przegląd Elektrotechniczny, Vol XXXV, No 10, 21 October 1959, Warsaw, pages 437-439; CSO: 3388-N]

1. General Characteristics of Domestic Steel Mills

Of the 24 existing foundries (excluding the three for iron alloys), seven have a total of 25 arc furnaces and five induction furnaces (smaller induction furnaces not designed for smelting steel have been omitted).

The rated capacity of arc furnaces ranges from 3.5 to 4.5 tons (with the exception of a single 1.5-ton furnace). The total capacity of the arc furnaces is 219 tons, 160 tons of which belong to the six largest furnaces, each of a rated capacity of 15 tons and over, and 59 tons belong to the remaining 19 furnaces.

After the Warsaw Foundry put into two 45-ton furnaces into operation, the share of electric steel produced by large furnaces (more than 15 tons) increased from 54 to 73 percent.

The total capacity of induction furnaces of rated capacities of 0.5 to 3.0 tons is 9.5 tons.

For the sake of comparison, it may be added that--besides foundries--a number of other enterprises, such as mechanical equipment plants, enterprises of the motor-vehicle and railroad rolling stock industry, have a total of about 30 arc furnaces of an over-all rated capacity of about 170 tons (these are small-capacity arc furnaces).

a) Furnace Transformers

The primary voltage of furnace transformers are 6 kilovolts (12 furnaces), 15 kilovolts (nine furnaces), 20 kilovolts (one furnace), and 35 kilovolts (two furnaces).

It should be explained that higher primary voltage is more advantageous for high-capacity furnaces. Under such circumstances it is easier to control short circuit currents, whereas smaller primary currents in furnace transformers permit a saving on nonferrous metals required for the primary feeder and ensure more static operation of the distribution system as well as lower voltage drops. A primary voltage of 30 kilovolts is recommended. Some old-type furnaces have transformers that are too small with respect to their capacities (260 to 330 kilovolt amperes per ton), for example: 15-ton Siemens furnaces--4,000 kilovolt amperes; 4-ton BBC [Bovery, Brown and Company, Swiss Concern] furnaces--1,300 kilovolt amperes; 6-ton Demags--1,930 kilovolt amperes. These furnaces should be modernized and their transformers replaced.

These transformers are regulated by a tap-change switch with the aid of a Delta-star changeover switch.

b) Furnace Disconnect Switches

The most commonly used power switches are air [powered] breakers (in 16 furnaces) and oil breakers (in six furnaces).

It should be emphasized that power switches are of essential importance to the proper operation of arc furnaces; therefore, only tested types of switches which can withstand a large number of connections under full load should be used.

c) Arc Regulation

The above described furnaces have four different arc regulating systems:

- 1) Relay-contactor with continuous DC voltage source (ten Doha furnaces from East Germany);
- 2) With rotary amplifiers--amplidynes (Soviet DS-5, DSW-45, Birlec furnaces, and domestic Biprohut furnaces as well as old-type Stein-Roubaix furnaces--a total of eight);
- 3) Relay-rotary with Tirilla relay and Leonard convertor (in five Heroult and Demag furnaces);
- 4) Hydraulic (in three BBC furnaces).

The relay-contactor system is still the most widely used in Poland. This system requires continuous maintenance and frequent testing and exchange of contacts. Its operating costs are therefore high.

Regulation with rotary amplifiers (amplidynes) is faster and more sensitive as well as more reliable in operation.

Relay-rotary regulation is too slow in operation and results in frequent furnace power failures due to overloading. This regulation system is to be replaced in the near future by regulation with rotary amplifiers.

The use of imported furnaces with contactless regulation employing magnetic amplifiers and asynchronous motors is not planned, although this type of regulation certainly has some advantages.

2. Electric Power Consumption Indices

With respect to the consumption of electric power, electric steel mills occupy second place (13 percent) to rolling mills (18.5 percent). The share of electric steel production in relation to Martin steel is about 5.5 percent.

The unit consumption of electric power can be calculated for an entire electric steel plant, for the individual furnaces, and for each smelting. The data on which to calculate the unit power consumption should be registered on the smelting chart, which must indicate the fusing conditions, such as length of fusing periods, meter readings of active and apparent power, tap positions, etc.

The unit power consumption varies considerably with the individual furnace smeltings. Such variations also occur for each furnace on a monthly scale, although to a lesser degree.

The effective average monthly values of the unit power consumption for various furnaces during the first quarter of 1959 are presented in Figure 1 [not reproduced]. The continuous line corresponds to the average index value for normal operation of arc furnaces of various charge capacities (according to Anhaltsszahlen of 1957). The operating results of one electric steel plant with four arc furnaces of 25, 15, 6, and 5-ton capacities are presented in Table 1. The monthly indices are shown in Figure 1.

Table 1

Operating Data of Electric Steel Plants in the
First Quarter of 1959

Type of Furnace	1 25 tons			2 15 tons		
Rated Capacity	8,950 Kva			4,550 Kva		
Transformer Capacity	357 Kva/t			303 Kva/t		
Transformer Unit Capacity	Leonard (cont.)			Tirill-Leonard		
Arc Regulation	(basket) 12 minutes			(basket) 12 minutes		
Charging Time						
Operating Period	Jan	Feb	Mar	Jan	Feb	Mar
1. Actual smelting charge, average	36.5	36.7	36.8	19.7	19.7	20.2
2. Number of smelt-ings per month	79	70	84	83	80	86
3. Number of oxygen-swept smeltings	8	8	11	12	6	19
4. Percent of smelt-ings with oxygen	10	11.4	13	14.4	7.4	22.1
5. Hours of smelting time, average	4.01	3.92	3.42	3.27	3.35	3.25
6. Furnace output, in tons per hour	3.55	3.65	4.13	2.18	2.30	2.17
7. Index of average power consumption, kilowatt hours per ton	773	661	649	849	820	811
8. Consumption of electrodes, kilo-grams per ton	15.1	11.8	7.4*	13.2	9.1	10.2
9. Number of elec-trode breakdowns	16	8	4	10	10	15
10. Percent of rejects with respect to the charge	1.9	2.3	2.4	3.4	2.3	4.7
11. Number of furnace wall repairs	2	1	2	1	1	1
12. Furnace arch changes	4	3	3	4	2	4
13. Furnace hearth repairs	-	-	-	-	-	-
14. Calendar time utilization factor (%)	94.1	93.5	91.9	88.8	92.3	92.7

[table continued]

[Table 1 continued]

Furnace Type	3			4		
Rated Capacity	6 tons			5 tons		
Transformer Capacity (supplying)	3,780 Kva			2,500 Kva		
Transformer Unit Capacity	-			500 Kva/t		
Arc Regulation	Tirill-Leonard			Relay-Contactor		
Charging Time (minutes) (case-bundles)	37			12		
Operating Period	Jan	Feb	Mar	Jan	Feb	Mar
1	9.4	9.4	9.4	7.3	7.3	7.4
2	85	86	89	111	96	110
3	8	12	15	28	32	40
4	9.4	14	16.8	25.2	33.3	36.4
5	3.01	2.59	2.75	2.14	2.09	2.02
6	1.10	1.09	1.09	0.96	0.95	1.0
7	1,013	945	985	968	808	708
8	13.7	11.8	11.1	14.4	12.1	10.9
9	4	1	2	3	3	6
10	4.5	3.3	3.6	7.8	4.2	4.5
11	1	1	2	1	2	1
12	4	4	5	7	5	7
13	-	-	-	-	-	-
14	84.8	96.1	89.1	91.7	92.7	91.9

*Using imported graphite electrodes.

Operation time:

- Torsion of electrode--15 minutes
- Change of broken electrode--30 to 80 minutes
- Conduit repair--30 to 60 minutes
- Replacement of arch--1.5 to 2.0 hours
- Repair of furnace wall--19 to 30 hours
- Repair of hearth--65 to 72 hours, every 2 to 12 months, depending on the quality, type of wall, and use of oxygen.

The lowest average monthly index value of 649 kilowatt hours per ton was attained by the 25-ton furnace, No 1 (according to Table 1) in the month of March. During that same month, the indices of the respective smeltings of that furnace ranged from 556 kilowatt hours per ton (for carbon steel, 20) to 886 kilowatt hours per ton (for carbon steel, 25). The substantial increase in the index of that furnace during the month of January--19 percent (773 kilowatt hours per ton)--as compared with March (649 kilowatt hours per ton), can be explained, on the basis of data compiled in Table 1, by the

poorer charges (longer fusion time; 4.01), frequent electrode failures (16), the high consumption of electrodes (15.1 kilograms per ton) and by the smaller use of oxidation in the smelting process (10 percent compared with 13 percent in March).

For the other furnaces, No 4 for example, the highest index of 968 kilowatt hours per ton is explained by the large number of rejects (wybrakow) (7.8 percent), the necessity of frequently rebuilding the arch owing to the poor quality of the brick (seven times), as well as by the large number of breakdowns and the high consumption of electrodes. The lowest index for this furnace--708 kilowatt hours per ton in March--was achieved because of the large share (36.4 percent) of smeltings swept with oxygen.

The high consumption of electrodes directly increases the electric power consumption per ton of produced steel, since the production of one kilogram of graphite electrode requires about 10 kilowatt hours (power required for graphitization and other processes). Taking 12 kilograms per ton as the average consumption for domestic electrodes and 7.5 kilograms per ton for good quality imported electrodes, we obtain an increase in the power consumption amounting to $4.5 \times 10 = 45$ kilowatt hours per ton, without accounting for material losses. In assuming that sweeping with oxygen reduces the unit power consumption, we should take into consideration the fact that the production of oxygen also required considerable amounts of electric power.

The addition of oxygen permits the acceleration of the sweeping process and a saving in costly fusing additives; however it reduces the stability of the steel shank. Sweeping with oxygen is especially advantageous in so-called recovery processes (from scrap iron smelting).

Besides the above factors, the unit power consumption is also affected by the preparation of the charge. Large blocks in the charge, ranging in weight from 0.8 to 3 tons, extend the fusion time. For example, the average fusion time for the No 3 6-ton furnace rose to 3.01 hours per smelting--that is, it increased 16.2 percent with respect to that obtained for the same furnace in February (2.59 hours per smelting).

The time utilization factor in furnace operation depends on the time lost in clearing away obstacles and doing repairs.

This factor is to a certain degree connected with the unit power consumption. For example, the unit power consumption for the 15-ton No 2 furnace, with a time utilization factor of 92.7 percent (in March), amounted to 811 kilowatt hours per ton and with a time utilization factor of 88.8 percent (in January) it increased to 849 kilowatt hours per ton. For the 6-ton No 3 furnace, with a factor of 96.1 percent (in February), this index was 945 kilowatt hours per ton and with a factor of 84.8 percent (in February) the unit power consumption increased to 1,013 kilowatt hours per ton.

An analysis, in broad outlines, of the operating results of arc furnaces on the basis of indices shown in Figure 1 indicates that furnaces of larger charge capacity (15 tons and more) with more modern equipment have adequate power indices. On the other hand, older furnaces of smaller capacities (4 to 6 tons) usually have indices that deviate from the average values achieved in modern arc furnaces. This is due to a number of causes, such as loading of charge by hand, furnace transformer of too low capacity, etc.

Besides the power consumed by the furnace for technological processes, additional power is required for the powering of various furnace mechanisms, conveyors, etc. The consumption of power for such auxiliary purposes in the above electric steel plants during the first quarter of 1959 was 18 to 19.5 kilowatt hours per ton of steel (which corresponded approximately to the indices of electric power consumption per ton of steel produced in Martin furnaces).

3. Cost of Electric Power in Electric Steel Plants

After the introduction of the new electric power rates on 1 January 1959, the share of electric power costs in the production costs of electric steel approximately doubled. This cost depends on the quality of the steel (carbon steel, low-fusing steel, high-fusing steel).

The effect of the changed rates on the share of electric power costs for three electric steel plants with diversified production is indicated in Table 2.

Table 2

Effect of Rate Changes on the Share of Electric Power Costs

A = Basic materials, net
 B = Salaries and general costs
 C = Electric power and water

Share of Costs in Percent	Carbon and Low- Fusing Steels	Carbon Trans- former and Low-Fusing Steels	Carbon Low- and High- Fusing Steels
According to 1958 prices			
A	71.0	81.0	78.0
B	21.0	14.1	17.7
C	8.0	4.9	4.3
Total	100.0	100.0	100.0
According to 1959 prices			
A	67.2	76.2	75.3
B	17.0	14.0	16.0
C	15.8	9.8	8.7
Total	100.0	100.0	100.0

The data presented in Table 2 represent average values. The actual costs with respect to the month and the hour of the day during which smelting is carried out would take a different form.

According to the new rates, the cost of electric power is four times as high during peak hours as during nonpeak hours. Since during the winter we have to consider both an extended evening peak of 1.5 to 5 hours and a one- to two-hours morning peak, the total peak hours during November through February is six to seven, which roughly corresponds to the time required for one smelting process. As a result, the electric power consumed for a smelting carried out during peak hours, in terms of general production costs, will amount to not 16 percent but about 50 percent for carbon steels and over 25 percent for steel alloys of the plant's total production costs.

Thus, with a consumption of about 800 kilowatt hours per ton and a rate of 1.40 zlotys per kilowatt hour, the cost of power required per ton of steel will be about 1,100 zlotys.

The over-all total of morning and evening peak hours is about 1,100 per year, which corresponds to about one-eighth of a year.

These figures indicate the large share of electric power costs and at the same time emphasize the importance of economizing on electric power.

4. Conclusions

The above problems regarding the consumption of power in electric steel plants lead to the following recommendations:

- a) The introduction of standardized fusion charts in electric steel plants which would include records required for the control and analysis of power consumed by the respective smelting processes. The unit consumption of electric power required for molten steel (that is, for the charge without the scraping) should be kept uniform.
- b) The introduction in electric steel works of a power technician who would calculate, test, and analyze the power indices of the respective smeltings.
- c) The modernization of certain old type furnaces (Hercult, Demag) or their replacement by modern and larger units.
- d) Study of the change and adequate selection of the transformer capacity in modernizing furnaces.
- e) The organization of special departments for controlling the quality of the refractory materials and graphite electrodes.

POLAND

Review of the Work of the Permanent Commission for
Construction of the CEMA

[This is a translation of an article by
Stanislaw Bartoszewicz, Warsaw, in Prze-
glad Budowlany, Vol XXXI, No 10, October
1959, Warsaw, pages 461-464; CSO: 3359-N]

A year ago, in September, on the basis of the Resolution of the Ninth Session of the Council of Mutual Economic Aid [CEMA] of Socialist Countries, a Permanent Commission for Construction (Stala Komisja Budownictwa) was created. During an organizational conference which took place in Berlin in mid-September 1958, the organizational forms of the work of the commission were discussed and the working bodies in the form of the permanent secretariat and permanent problem-branch section were created; the premises of action were also discussed and established.

The sections started work in late autumn of last year and this year; as a result of the work of the sections, during the second meeting of the commission in April the detailed plan of work for 1959-1960 was approved. The present period (the second half of 1959) has been devoted to completion of reports on the first stage, and some of them, in the form of recommendations and drafts of decisions, will be presented within the next few months for acceptance at the plenum of the commission and then, in the form of proper legal acts, will be introduced in the individual member countries of the CEMA.

As can be seen from this brief chronological outline, in less than a year planned technical and economic cooperation has been organized on a wide front in the field of construction; it therefore seems proper and of interest to discuss in more detail the intentions of the commission, the range and techniques of the work, and the first concrete results of the commission's activities.

I do not think it necessary to discuss in detail the premises and system of operation of the Council of Mutual Economic Aid, which in 1959 celebrates its tenth anniversary, because

these are matters sufficiently well known to the general public from the daily and economic press. It would perhaps be necessary only to recall that the basis of the activities of this important economic body and all its parts, such as the Commission for Construction and similar organizations, is the search for and organization of the best forms of mutual aid of the member countries, which will ease and facilitate the execution of the targets of the planned economy of each of the participating countries. It follows from this statement that the CEMA is not a supranational organization and does not have a directive nature, and the resolutions of the council are of the nature of proposals and recommendations for the interested governments and do not in any way limit their independent action. This important principle of operation is closely observed on all levels of operation of the commission and its sections. A consequence of the acceptance of such a basis of action is the determination of subject matter in which all the contracting parties are interested and the working results of which facilitate for all the member countries the execution of their own domestic tasks. On the other hand, it is necessary to stress that the reports of the organizational units of the CEMA do not, in principle, take the place of normal bilateral cooperation of the individual countries, leaving the freedom of action of this type concerning both form and content to the interested parties.

The premises of cooperation formulated in this way result in the fact that the main directions of interest and action of individual commissions of the council are problems of norm unification, of accounting analysis of long-term plans from the point of view of searching for the most economical methods of covering the needs--mostly in the field of means of production and considering the most advantageous forms of division of productive targets, forms of cooperation, and other methods of mutual aid. It is obvious that the foundation of such complicated and difficult work is, first of all, a thorough mutual acquaintance with the branch problems in the individual countries and the finding of the proper common method of determining comparative methods. The preparation of proper and effective comparative methods is now given much attention in the plans of work of individual council members.

Against this background of generally formulated targets and methods of action, the methods of work of individual commissions take various forms according to the specific branch conditions. Some of the commissions, such as the Commission for Machinery (Komisja Maszynowa), place the main stress on the

preparation of a plan for the most advantageous distribution of productive tasks among the individual countries and finding proper methods of cooperation; other commission, such as the one for power, prepare the premises for an international power system.

The degree of independence of the operation of sections within the framework of operations of the given commission also differs.

The Commission for Construction has based its activities on far-reaching independence of work of individual sections.

The following work sections have been organized:

1. Section on Construction Materials (Sekcja Materialow Budowlanych)
Headquarters: Moscow
Chairman: Prof K. W. Nikulin
Chairman of Polish delegation: Engr St. Bartoszewicz
2. Section on Design Solutions (Sekcja Rozwiazan Projektowych)
Headquarters: Warsaw
Chairman: Vice Minister Engr S. Fariaszewski
3. Section on Development of Production Bases (Sekcja Rozwoju Bazy Produkcyjnej)
Headquarters: Prague
Chairman: Engr I. Gertner
Chairman of Polish delegation: Engr. W. Andrezejewski
4. Section on Regional and Urban Planning (Sekcja Planowania Regionalnego i Urbanistyki)
Headquarters: Budapest
Chairman: Vice Minister L. Lux
Chairman of Polish delegation: M. Benko, Vice President of KUA [not identified]
5. Section on Economics of Construction (Sekcja Ekonomiki Budownictwa)
Headquarters: Bucharest
Chairman: E. Florescu
Chairman of Polish delegation: Engr W. Kulesza

The chairman of the Commission for Construction (official name: Permanent Commission for Economic, Scientific, and Technical Cooperation in the Field of Construction [Stala Komisja Wspolpracy Gospodarczej i Naukowo-Technicznej w zakresie budownictwa]) is Engr G. Kosel, the First Deputy of the Minister of Construction of East Germany. The chairmen of delegations of the individual member countries are mostly Ministers of Construction or their deputies.

For Poland, the delegation is headed by Minister Magister Engr Stefan Pietruszewicz.

The organization has the following statutory tasks:

1. Preparation of motions concerning economic problems in the field of construction relating to the interests of several countries that are members of the council, aimed at lowering the costs of construction, economizing in construction materials, proper utilization of mechanization, application of rational constructions, introduction of substitute construction materials in place of scarce ones, and preparation of uniform methodology of planning in the field of construction.

2. Organization of exchange between the member countries of leading production experiences; scientific research, planning, and designing achievements in the field of construction in order to eliminate unjustifiable repetition in this work and through the utilization of the possibilities of every member country for rapid introduction in construction of leading achievements.

3. Preparation of a plan for technical uniformity of conditions and standards in the construction and construction materials industry, particularly as concerns the module system.

4. Preparation, on the basis of motions of the council member countries, of problems of development of production of individual kinds of construction materials and, with the participation of other permanent CEMA commissions, of problems of development of production of the most perfect installations, mechanisms, and tools, taking into account the individual division of labor among the member countries.

Such are, briefly, the main tasks of the Commission for Construction agreed upon during its first meeting. They served as the basis for more detailed programs of work of

individual sections. During autumn of last year and the first months of 1959, the individual branch sections were formed, prepared the drafts of plans of work for 1959-1960, and presented at the second meeting of the commission both the detailed programs of action and, in certain cases, their first concrete reports.

Thus the Section on Construction Materials, as a result of several projects undertaken in all the participating countries and on the basis of discussions conducted in Moscow during two meetings, presented a collective report concerning the balance of needs and production for 1959-1960 of the most important types of construction materials. The above report was provisionally accepted by the plenum of the commission, with a recommendation that it be further elaborated and that a closer analysis of its current results be presented in the form of working motions.

It should be stressed that in this phase of the report it was already possible to achieve some concrete results: an investigation was made of the possibilities of covering the increased needs of the participating countries for an important raw material for the production of modern construction materials--asbestos--by increasing the production plan for this raw material in the USSR.

As a result of this, advantageous conditions were created for increasing the participation of asbestos and cement products with relation to other less progressive materials in Poland, Czechoslovakia, and other member countries. As concerns the planned technological work, the Section on Construction Materials has now designated as most important an analysis of the possibility of modernizing production in the following materials: cement, light aggregates, light modern wall materials, and products of plastic materials.

As a result of this decision, individual countries having considerable experience in these industries prepared reports proposing development trends for the next few years with regard to the discussed materials. These reports, after being supplemented by the suggestions of the remaining members, will be discussed at a meeting of the section and, in the form of proper recommendations, will be conveyed for use by the interested countries.

The forms of discussions and reports are diverse.

For example, in the field of cement production there will be a special meeting in November of a working group of specialist who, after listening to some basic technological lectures, will determine the most progressive directions of development of this important branch of industry. The problem of widening the application of plastic masses in construction was a subject of debate in the Section on Construction Materials at the third meeting of the plenum of the section in Kiev, and after the proper decisions are taken there, it will in turn be a subject of intercommission debates of the Commission for Chemistry (Komisija Chemii) and the Commission for Construction, and perhaps, as an obvious problem for the future, will be sent in the form of prepared requests to a meeting of the Council of Mutual Economic Aid.

The remaining technological problems will, in principle, be prepared by the middle of 1960.

Apart from technological subjects, during the next few months the Section on Construction Materials will prepare a collective balance of machine needs for 1959-1965, the conclusions from which, particularly with regard to the postulated quality of machines, will be the basis for [establishing] proper sections and commissions of the machine industry.

As concerns the norm studies, the individual countries distributed among themselves the tasks of preparing a draft of unified norms for individual groups of construction materials. The reports will be discussed and accepted by the section in 1960. In 1960 it is also planned to organize a conference of research institutes dealing with the problems of construction materials.

As is evident from this brief and incomplete discussion of the subject matter of work of the Section on Construction Materials, the studies concern the key development problems of that industry.

The times specified in the plan and the state of the present realization of the work of the section indicate that by the middle of next year we will have at our disposal very valuable documents which will certainly help in implementing the new tasks in the development of industry. Particularly as concerns the production and application of construction materials made of plastics and light aggregates, such aid is very important for us and will undoubtedly facilitate and

speed up the execution of tasks which in this field mean the building of an industry completely unknown in Poland.

However, a review of the material problems would not be complete if we did not mention the problems of the glass and ceramic industries, only a part of whose production consists of construction materials, which determined through their representatives the correctness of the principle of conducting complex studies on the possibility of scientific and technical cooperation. The Commission for Construction shared this view, passing a resolution to include the problems of glass and ceramics in its program. However, in view of the fact that the administrative dependence of these industries in certain Council-member countries is not on construction (e.g., in Czechoslovakia the ceramic and glass industry is subordinate to the Ministry of Light Industry), differences in opinion emerged as to the organizational treatment of this problem. Until the matter is finally settled by the general secretariat of CEMA, the scientific and technical cooperation in this field will be conducted by a separate permanent working group, which method is a departure from the carefully observed principle of two-stage work (commission-section) within the framework of the Commission for Construction but which facilitates the carrying out of program activities in this important sector. Without entering into details of the plan of work of this group as a problem rather distant from strict construction questions, I wish to stress that in this sector too the plan of work aims toward mutual maximum utilization of technical and technological achievements, and in the studies there are also problems of construction glass, earthenware, enamels, and other construction supplies in this field.

While in the Section on Construction Materials the main weight of studies currently concerns a comparatively small group of subjects and the subjects will increase only in 1960 after the completion of studies on problems considered to be key ones, we have a different range of subjects and calendar of reports of the Section on Design Solutions with headquarters in Warsaw.

The first striking aspect is the wide range of studies and the planned dates for their completion, which point to a very intensive course of work started by this section. Several factors contributed to this state of affairs.

Firstly, the Section on Design Solutions is in a sense historically the oldest because it can be considered that the results of the first international standardization conference concerning construction held in Berlin in the beginning of 1958 were prepared by it.

Secondly, the Commission for Construction, during its organizational meeting, outlined very detailed recommendations for the program of this section, recommending, among other things, the preparation for 1959 of the second conference devoted to standardized designing even in the organizational period.

Thirdly, in the individual member countries there was a strong collective of men working on these problems, and this collective was capable of expanding it further. Fourthly and finally--and this factor was in principle decisive--the growing programs of construction of the member countries caused a social need for rapid execution of studies aimed at creating a mass base of standardized design patterns for the implementation of the rapidly growing construction needs, for both housing and industrial construction in all the participating countries, without exception.

It is not possible within the framework of a brief review of the work of the Commission for Construction to discuss in detail the full range of studies conducted by this very active section.

I will only try to give the most characteristic elements accompanying its work.

The recommendations formulated by the Commission for Construction centered the work of the section on the following main problems:

- 1) detailed studies concerning standard designing;
- 2) studies aimed at further raising the level of technical progress and industrialization of construction in designing solutions and methods of their realization;
- 3) organization of efficient exchange of experiences in the field of designing new constructions and methods of executions of jobs;
- 4) studies aimed at the introduction of a unified modular system;
- 5) studies concerning the improvement and popularization of improved methods of static calculation;

6) organization of proper methods of cooperation concerning the uniformity of norms of sanitary and fire protection designs;

7) organization of coordination of scientific research work;

8) organization of permanent technical information.

On the basis of such a wide program, the Section on Design Solutions conducted three plenary conferences in the period between October 1958 and July 1959 in Warsaw, Krakow, and Gdansk during which, apart from approving a detailed plan of work for 1959-1960, several concrete reports were completely or partially accepted. The main direction of the activities was the preparation of the Second International Standardization Conference (Druga Miedzynarodowa Konferencja Typizacyjna) of the socialist countries in September 1959 in Leningrad.

The conference in Leningrad was devoted to a discussion of the following problems previously analyzed by the section:

1. The tasks of standard designing on the background of the deepening cooperation of the socialist countries.

2. The principles of the international modular system in the socialist countries.

3. A uniform method of determining technical and economic indices of buildings and constructions.

4. Terminology in typical designing.

5. The program of division of labor and long-term planning in the field of unification of basic norms of designing.

6. A uniform international construction terminology in rural construction.

The theses and resolutions of the Leningrad Conference undoubtedly constituted a big step forward in the field of setting in order the basic problems connected with standardization in construction and, after acceptance and introduction by the interested countries in the form of proper resolutions or administrative ordinances, they will constitute a serious, concrete result of the work of the Commission for Construction. In the rich and extensive subject matter of the Section on Design Solutions, the reports connected with the development

of the chemical industry deserve special attention. Such tasks were entrusted to the section by the Commission for Construction during the second plenary meeting. They result from the necessity to organize speedy aid on the basis of effective cooperation for units designing investments in the field of chemistry, an industry particularly strongly developing in the council-member countries.

In accordance with this resolution, the section organized an international working meeting of experts in this field in Halle (East Germany) in June of this year, and after a discussion of the results of this conference at the third plenary meeting in Gdansk, the plan of action with regard to special subjects was approved; the plan, the implementation of which is scheduled mostly for this year, will, it seems, give concrete results, easing and facilitating design activities connected with the realization of the investment plans of the chemical industry for the next few years.

Finally, the preparation by the section of the subject matter of the first Information Bulletin (Biuletyn Informacyjny) prepared by the secretariat of the Commission for Construction and devoted to the problems and studies of the Section on Design Solutions deserves special attention. It should be stressed that the current state of studies of this section shows that the very wide program of action and the abundant plan of subjects are in principle executed punctually. Undoubtedly, however, there exists a certain danger of scattering efforts, particularly in the period after the Leningrad Conference.

During its last plenary meeting, the Commission for Construction clearly pointed out the necessity to concentrate efforts in the work of the individual sections; it is to be expected that this task too will be executed by the Commission on Design Solutions.

The third section working on a wide subject matter program and already undertaking a large number of studies is the Section on Development of Production Bases, with its headquarters in Prague.

Among the numerous tasks placed before this section by the Commission for Construction, two groups of problems emerge: studies aimed at selecting the technically and economically most advantageous machines for modern constructions and technical and technological studies connected with the development of production of reinforced concrete prefabricates.

Of course, within the framework of these two problems a detailed plan of work was prepared. It follows from the subject matter that this section is specially predestined for cooperation with the proper sections of the Commission for Machinery (Komisja Maszynowa) in the field of problems requiring the production of new or improved construction machines; on the other hand, close cooperation is necessary with the Section on Design Solutions (cooperation of executor with designer) and the Section on Construction Materials--first of all, in the borderland sector on technology of prefabrication and in several other sectors. It should be stressed that the problem of coordination of intersection work, with the deepening of the studies, will become more and more important, and undoubtedly the Section on Development of Production Bases will be forced to elaborate, with the aid of the secretariat of the Commission for Construction, the proper and effective methods of work in this sector. Among the studies to date a very careful screening by the section of the situation concerning its field in the individual council-member countries deserves special attention. Two basic reports were prepared: a report on the state of the technical level and one describing the ways in which mechanization of construction is developing. A collective report was also prepared concerning the level of production in prefabrication.

On the basis of these initial studies, the section work on detailed development targets for the 1959-1960 plan.

Since space prohibits the discussion of the details of the working program, I must stress the great importance of the recently prepared recommendation report concerning the machine needs of construction for the Five-Year Plan. This report was the subject of discussion at the third plenary meeting of the section in Prague in August of this year and may become one of the important foundations for the international division of labor among the machine industries of the member countries in the field of construction machines.

Special attention is also deserved by the planned reports aimed at raising the technical and technological level in the production of compressed concretes. This was put forward as a primary task during the second plenary meeting of the Commission for Construction.

The Section on Development of Production Bases implements this task, as it would seem from preliminary studies, in a very realistic and concrete way.

A section with a special character and specific individual methods of work is the Section on Regional and Urban Planning. This section, having its headquarters in Budapest, as a result of a resolution of the Commission for Construction, received the following recommendations for directions of activity:

- 1) methodology of preparation of schemes for regional planning;
- 2) purposeful organization of work in preparation of schemes of regional planning and their execution;
- 3) exchange of information of a legal nature with regard to construction problems;
- 4) the problem of rational distribution of industrial construction in connection with regional planning.

The above directions of action supplemented by an exchange of information and coordination of scientific research work were the foundation for the plan of the work of the section.

As follows from the subject matter given above, this section, to a greater extent than others, dealt with methodological studies and attempts to unify them. On the other hand, mutual exchange of information constitutes an important part of the work.

However, at the present moment, despite the already quite numerous reports of the section, it is difficult to evaluate the effects of this work.

Undoubtedly, mutual knowledge was increased in the field of methods of work and results obtained in the individual countries. Undoubtedly also, bilateral studies, such as Polish-Czech concerning the coordination of regional planning in the Upper Silesia-Pstrawa Basin region, gave a positive result.

It is difficult to say at present to what extent it will be possible to make the planning method uniform. It seems that this section will be forced, to a greater extent than the others, to investigate the effectiveness of the studies; in this spirit the resolutions of the Commission for Construction were passed during the second plenary meeting.

The Section on Economics of Construction, with its seat in Bucharest, was correctly called by one of its collaborators the section on "common language." The tasks set forth by the

Commission for Construction are numerous and very fundamental. They concern such problems as the preparation of uniform methodology of evaluation of the economic effectiveness of technical progress in construction, preparation of economic measures causing a more rapid application of new techniques, mutual information and exchange of experiences concerning the problems of price formation in construction, and many other fundamental economic problems.

However, the work begun in the section and its two conferences have shown that many correct recommendations cannot at present be implemented. It turned out that in the planning and economic methodology system used in the council-member countries in the field of construction there are several, perhaps not fundamental but essential, differences hampering and often preventing the finding of correct comparative parameters. In the words of one of the participants in the section debates, "we jointly talk about fruit, but you talk about pears and I about apples."

In this situation, the section, after preparing a collective report on the level and indices of construction in the CEMA member countries in the 1950-1958 period and the outlook for the development in 1959-1965, passed to methodological studies, such as a review of the economic indices in force or attempts to prepare uniform terminology.

Work of this type, extremely arduous and often complicated by the absence of good economic dictionaries, will probably take a long time, especially since the possible methodological unification of indices must be agreed upon in detail with the planning commissions of the CEMA.

Nevertheless, studies of this kind are necessary and after they are carried out will become an indispensable tool of action not only for the Section on Economics of Construction but also for other construction sections. In the present situation, however, we should expect an especially acute economic examination of their work on the part of all other sections.

Such is the working situation in the Permanent Commission for Construction and its organs after a year of activity. As is evident from the facts given, the commission studies embrace a majority of the fields of construction. In each participating country a large staff of highly skilled experts deals with the preparation of materials, reports, and evaluations.

Hundreds of construction engineers and economists participate directly in the debates in various ways.

The question appears: what is the useful result of this huge work?

It seems that at the present moment it is difficult to answer this question. Today it is only possible to speak about potential, prepared values, and in the next few weeks more and more about finished reports. What their kinetic value will be, to what extent they will be consumed by Polish construction will to a large extent depend on the efficiency of the managing apparatus, on honest information quickly supplied--in a word, on the proper working of the system of implementation of the results of international co-operation.

It seems that in this system of implementation a great and responsible part will be played by our technical press, always in the first line of fighters for better, efficient, and more economical construction in Poland.

If the above article helps even partially in this great and important program, it will have fulfilled its purpose.

POLAND

Mining Machines

[This is a translation of an article by
Magister Engr Jan Swierniak in Przegląd
Techniczny, No 48, 4 December 1959, War-
saw, pages 19-20; CSO: 3387-N]

Apart from the organizational aspects connected with the problem of mechanization, the basic condition for the favorable solution of this problem is the choice of proper machines and installations for individual mining jobs.

The requirements of the miners concerning the machines working at the bottom of a mine differ from the generally accepted requirements for surface machines. A machine or installation destined for work in a mine must be infallible in operation, must have a compact construction of small size, the lowest possible weight, ease in operation, safeguards against electric short circuits and explosion of gases, safety of operation, and resistance to the corrosive action of gases and mine waters.

These requirements follow from the specific conditions of work in the mines where difficulties occur in the transport of machines to the place of work, in the high degree of humidity and gas saturation of the atmosphere, and where work takes place in a limited space.

Under these difficult conditions, the miner should find the machine his infallible and well tested ally and aide in work and has a right to demand that the machine or installation give him relief in his difficult and responsible work and guarantee his personal safety.

In the initial postwar period, mining was to a large extent dependent on import of machines and equipment from abroad. The development of the domestic industry in this field is gradually making mining independent of imports and, since 1955, it has permitted the export of production surpluses in certain fields.

Ignoring the years 1945-1948--the period of organization of the mining machine industry--and taking 1949 as 100, the index of the value of production (in comparable zlotys) reached 336 in 1955 and 491 in 1958, and the expected index in 1960 will be 529; on the other hand, the index of increase in tonnage of production was 242 in 1955, 298 in 1958, and will reach 327 in 1960.

At the present moment the industry of mining machines construction is producing almost a complete range of types of machines and installations used in our mining. The main groups of machines and installations in the current year includes about 300 machines for mining, about 960 machines for loading, about 3,400 for continuous conveyance of the product, about 12,000 tons of steel casings (obudowy), about 3,500 tons of lift installations, and about 9,000 tons of machines and installations for the mechanical processing of coal.

The industry of mining machines construction consists of 22 production plants and two central planning and designing bureaus, with a total of about 20,000 employees. The productive potential of that industry is adapted and able to cover the growing demands of domestic mining and of export in the next Five-Year Plan.

The domestic designing and research base developed simultaneously with the increase in the productive potential in the factories. Apart from the factory designing bureaus, dealing mostly with modernization of the types of machines and installations in production, two central planning, designing, and research bureaus are active: the Designing and Mechanization Plants of the Coal Industry (Zakłady Konstrukcyjno-Mechanizacyjne Przemysłu Węglowego) and the Planning Bureau of the Plants of Mechanical Coal Processing (Biuro Projektów Zakładów Mechanicznej Przerobki Węgla).

As a result of the work of these bureaus, production was started on several modern types of machines and installations, such as chain and drum combines, modern conveyors, loading machines of various types, modern water-regulating machines, enrichers of heavy liquid, etc.

On the basis of long-term plans of mechanization of production processes in the mines, further designs of modern mining machines and equipment will be prepared. It is first of all planned to equip the exploitation walls with assemblies of machines and installations for complex working on

coal. There will be coal combines moving on armored comb conveyors, moved as a whole with the aid of mechanical or hydraulic movers. Coupled with mechanized hydraulic encasing, moving with the movement of the conveyors, this installation will decrease labor consumption in work in coal fronts and will permit the attainment of full assembly mechanization in the system of wall extraction, basic in our mining. For lower layers, cutters of limited height with electric or hydraulic propulsion will be produced.

Fast-moving efficient machines will increase the concentration of extraction and the degree of utilization of the productive potential of a unit of exploitation front.

With the aim of further eliminating manual loading, which entails the greatest physical exertion of the miner, the production of light shaker loading machines will start in 1960, alongside the already produced rake loading machines.

For the scraping exploitation systems it is planned, as of 1960, to use modernized, short comb conveyors and light auxiliary conveyors to transport the product. In view of the operation of machinery in a limited space, the solution of a metal casing safeguarding the field of work is important. These installations will also be produced in the next few years.

By supplying the mines with pavement assemblies, already in serial production, and universal tunnel borers, on caterpillars, the production of which will start in 1960, it is planned to make rapid progress in boring and constructing tunnels. In addition, it is planned to produce machine assemblies to mechanize the encasing of tunnels.

As of 1960, highly efficient percussion drills will be supplied, which will replace the equipment previously imported.

The mines will be equipped with more efficient mechanical hammers, arbors with circulating transmissions of new construction, and installations facilitating auxiliary work concerning the so-called small mechanization, such as cable railways, traction for the transport of encasing elements and other materials, small auxiliary arbors, short comb and belt conveyors, lifts for steel stands, and presses for straightening casings. The production of these installations is already fully under control.

Apart from the advancing machines and installations for bottom transportation, the domestic mining machines industry fully covers the needs of mining in sector pumps, pumps for main drainage, and pumps with high technical indices for the purpose of hydromechanization, as well as "lute" ventilators and ventilators for main airing of medium productivity. The production of rotating quiet-working ventilators for the main airing of mines will also be started.

All the machines, except those destined for mines with high gas content, will be generally based on electric power, assuming the gradual elimination of the expensive compressed air power.

Mines with a high gas content will be supplied with machines with air propulsion, both for coal extraction and for conveyance and transport. It is also planned to use hydraulic engines in advancing machines.

In 1960, the serial production of two-hour isolation oxygen equipment for rescue teams will be started and, beginning in 1961, that of one-hour oxygen equipment for miners for safe evacuation from threatened areas in mines with a high density of methane in the air. The CO absorbers, already constituting standard equipment of the bottom crews, will be modernized and improved.

All the coal extracting machines will be equipped with watering installations to combat coal dust. The production of installations for distributing water under pressure in the coal opening has already started. This method effectively combats coal dust, preventing its entry into the atmosphere of the mine and at the same time facilitating the work on the coal. New aggregates with increased water pressure will permit the use of this method on harder coal, which is difficult to work on.

The so far positive results of the use in the "Bielszowice" Mine of experimental automation of belt conveyors and section and main pumps steered from section control points created sufficient grounds for the popularization of these installations in mines.

The development of automation of steering and control of machines and installations at the bottom and the surface of the mine depends first of all on getting under control and increasing the production of electrical equipment.

The industry of mining machines concentrates special attention in the plans for 1960-1965 on the development of production of installations for mechanical processing of coal. Poland's maintenance of her position on the world market as a coal exporter requires that the quality of export coal be raised, and the development of the domestic foundry industry depends on increasing the quantity of foundry coal. Both these circumstances require the construction of new processing plants and the expansion of existing ones. So far, this field has been somewhat neglected in the Polish coal industry, and the processing plants which were constructed were based mostly on import.

In recent years we made an important step forward in this field and we started the production of complete washing columns for export. The development of production of installations for washing columns and sorters will be continued, and in 1965 the production of installations of this type will increase by 50 percent in comparison with the current year.

Apart from quantitative development, there will be a further widening of types, with special attention concentrated on the production of modern, highly efficient machines. Already prepared or under preparation are the designs of new types of pistonless setting machines with a productivity of up to 200 tons per hour, turbines for slime, new highly efficient resonance and vibration sorters for sorting and drainage, enrichers of heavy liquids, drying installations for floated coal, hydrocyclones, etc.

As for extracting installations, a considerable increase in production will also take place to cope with the needs connected with the construction of new mines and levels. In 1965 it is planned to produce 5,000 tons of these installations, which means a 43-percent increase over the current year. The development of this branch of production and also of pit machines, whose production will increase 100 percent over 1959, is indispensable to equip newly constructed mines on time with installations for vertical transportation and for the circulation of cars in lower and upper pits.

The plans for the development of the power industry on the basis of the construction of new open-pit brown coal mines place serious tasks before the factories for mining machines concerning the starting of production of rapid belt conveyors with a productivity of up to 10,000 cubic meters

per hour. The production of these conveyors is in the course of organization and after 1960 should reach about 6,000 tons of installations per year.

To ensure the continuity of work of machines and to shorten the period of their repairs, the production of spare parts is developing simultaneously with the production of complete units. At the present moment the problem of spare parts has, in principle, been solved in the mining machines industry. Almost all parts can be obtained at any time from warehouses for typical machines.

The progress in mechanization of mining depends strictly on modern mining equipment, not only on design and execution but also on the quality of materials used in production and the parts and assemblies received from other industries. In this field the machine factories encounter serious difficulties.

A condition for increasing the resistance and service life of elements of mining machines and lowering their weight is the use of steel casts of high quality, rolled and wrought products from alloy steels or of improved quality, and new profiles. In this sector there are still many difficulties--for example, in collaboration with the rubber and plastic materials industry.

The problem of getting the production of oil resistant gaskets and high-pressure hoses under control in the rubber and plastic materials industry has become a matter of primary importance for the mechanization of mining, in view of the development of hydraulic construction in the machinery equipment of mines.

However, the most important problem is that of engines and electric appliances. The conditions under which the mining machines and installations operate create high demands in the field of electrotechnics.

The factories and designers of machines have considerable difficulty in obtaining new types of engines, circuit breakers, switches controlling the direction of revolutions, electromagnetic releases of brakes.

In the production of head lamps, there is a shortage of domestic production of two-fiber bulbs with increased light-

ing power and light batteries with a longer lighting period. It would be possible to quote many more examples of poor cooperation.

The needs of the coal industry are not sufficiently provided for by other industries, despite the obvious fact that, just as coal is the basic raw material for many branches of domestic industry, the development of the coal industry is to a large extent determined by contributions of the foundry, machine, chemical, and electrotechnical industries.

The assumed directions of technical progress and development of production in mining machines factories ensure a full supply of mining machines and equipment for domestic mining and also permit a considerable increase in exports in this field.

POLAND

Analysis of 1958-1959 Achievements of State Farms
and Plans for 1959-1960

[This is a translation of an article by
St. Czajkowski and J. Malek in Nowe Rol-
nictwo, Vol VIII, Nos 21 and 22, 1 and
15 November 1959, Warsaw, pages 810-813
and 807-809; CSO: 3445-N]

An analysis of the execution of the plan for the last two years and of the plan for 1959-1960 proves clearly the correctness of the present trend of management in the PGR's [Panstwowe Gospodastwa Rolne; State Farms]. Clearly, sufficient results were not attained in all farms and fields of production, but in the majority of farms there was a definite change for the better. It is a fact that the difficult weather conditions of this year, although they reduced the possibilities of attaining high yields, did not cause a breakdown in production, as used to happen in past years.

Despite the drought, the farms usually had no worse and often better crops than last year, with a simultaneous considerable development of animal production. This testifies to the stabilization of the economy, better methods of work, and the correctness of the chosen directions of production.

The plans for 1959-1960 assume, in effect, the liquidation of deficits in the PGR's as a whole, and the past quarter of this year shows that these plans are fully realistic.

Economic changes in the PGR's were initiated in 1956 and in the 1957-1958 economic year the comparable total losses were already lowered by 38 percent. In 1958-1959 the cut in losses was 36 percent, and the remaining 24 percent of the 1956 losses will be liquidated this year.

The main element responsible for such an improvement in the results of the PGR's was the increase in production, which constitutes 46 percent of the total improvement in the accounting balance, the cut in costs constituting 31 percent (including decreases in [cost of] administration and excessive employment, amounting to 18 percent of the total despite two

wage increases); 17 percent of the improvement in results is due to the difference in the increase in prices of agricultural products as well as of industrial products purchased by the PGR's, and the remaining 6 percent consists of small items resulting from the increase in certain supplementary incomes and specific payments. This computation shows the healthy economic foundations of the financial results obtained.

The development of the PGR's in that period also had certain negative aspects, but their weight and importance are small and do not negate the correctness of the main direction. For example, many farms undoubtedly exaggerated the limitation on hogs. In many cases the tendency to cut production costs was improperly expressed in cutting the necessary expenditures for the purchase of artificial fertilizers, fodders, or productive livestock. Often, for lack of funds, a necessary current repair was postponed which will undoubtedly make further expenditures for this purpose necessary in future years. The farms which have already emerged from deficits, however, usually make up for any backlog in repairs in a short time.

Other examples of this kind are the frequent cuts in expenditures on cultural and educational purposes, on safety and hygiene of work, etc. These manifestations certainly exert a negative influence but--particularly with a constant improvement in the level of cadres--they occur less frequently and cannot in any serious way affect the development of the PGR's.

An analysis of the individual branches will show the development tendencies and the factors slowing down production.

At present the state farms (excluding specialist ones) possess 2.3 million hectares, including 2.1 million hectares of usable agricultural land, of which 1.6 million hectares are under cultivation.

The area of usable land decreased by 300,000 hectares in comparison with 1957 in connection with the transfer of certain lands not suitable for large-scale commercial production (Table 1). The present state of PGR possessions will not be subjected to major changes.

Table 1

Area of Usable Land; Area of Land under Cultivation, in 1,000 Hectares; Structure of Sowing and Crops

Województwo Administra- tion	Usable Land in 1,000 Hectares		Area Under Culti- vation	Percent of Grains Ex- cluding Corn		Percent of Root Crops	Crops of Four Grains in Quin- tals			Yield of Winter Swedish Rape in Quin- tals
	1959	1-7 1959		1959	1959		1958	1958	1959	
Warszawa	35	28	46.4	19.5	18.9	209.8	17.0			
Bydgoszcz	149	131	47.5	19.6	17.7	197.8	14.3			
Poznań	193	165	48.1	21.8	18.4	181.5	15.5			
Łódź	21	18	46.2	21.9	22.2	216.3	16.6			
Kielce	7	6	44.2	21.4	20.2	186.7	15.5			
Lublin	43	31	51.0	12.4	13.0	239.0	11.5			
Białystok	76	44	51.3	11.7	8.7	139.4	11.0			
Olsztyn	317	201	51.7	12.0	10.0	154.4	10.3			
Oświęcim	129	92	47.7	15.7	14.2	195.4	16.7			
Koszalin	337	268	50.4	14.9	10.3	139.0	10.3			
Śleszczin	277	206	52.2	13.1	12.8	179.2	13.5			
Zielona Góra	155	123	51.0	14.3	14.0	179.0	12.2			
Wrocław	244	198	49.7	14.9	15.9	188.6	12.3			
Opole	92	78	47.8	18.5	16.1	195.8	13.2			
Katowice	25	21	45.9	21.3	19.2	183.8	13.4			
Rzeszów	65	23	48.1	13.1	11.8	248.0	11.9			
Łódź	2165	1633	49.9	15.7	13.8	193.9	11.1			

Of the total lands, 25.4 percent are wheat and beet soils, 21 percent are soils defined by farmers as suitable for barley, 37.6 percent are rye-potato soils, and 16 percent are sandy or gravel soils on which, with their present cultivation, only rye or lupine can be grown.

The location of the PGS' in the country is not too favorable, since over 40 percent of the farms are located in the northern sections, which have less favorable climatic conditions than the central part of the country.

The structure of production and productivity are influenced not only by soil and climatic conditions but also by the degree of development.

It follows from the data that about 40 percent of the land is not regulated (melioracija) and about 40 percent of the existing regulation installations require renovation.

About 40 percent more of capital assets is still needed to attain a complete investment saturation of the PGR. As a result, extensive farming still has to be pursued in many regions. This is reflected in the structure of sowing:

<u>Crop (in percent)</u>	<u>1959</u>	<u>1960</u>
Grain	50.1	48.5
Corn	1.1	3.2
Root crops	15.6	15.8
Papilionaceous for fodder	18.0	16.0
Papilionaceous for hay	8.2	9.1
Oil and fiber plants	3.7	4.0
Green fertilizers	2.1	2.2
Others	1.2	1.2
	100.0	100.0

The percentage of root crops is still comparatively low, while the percentage of fodder cultivation is too high. The only more important change is the considerable increase in corn cultivations for fodder at the expense of root fodder crops and papilionaceous plants for fodder, and an increase in the cultivation of oil plants and potatoes.

Table 2

Yield per Hectare in Quintals

Indicators	1956	1957	1958	Estimate According to PIP* 1959
Grains	11.9	13.4	13.8	14.3
Sugar beets	145.2	169.2	183.9	171.0
Potatoes	103.0	101.0	97.3	112.0
Winter Swedish rape	7.7	9.3	8.9	14.3
Hay from meadows	16.6	17.6	21.4	22.0

*[not identified]

The computation in Table 2 shows the stabilization of crops. The yields are still not high--particularly in potatoes, which require a higher level of work and greater fertilization. On the other hand, it is an encouraging phenomenon that considerable progress is shown by farms which until recently were very neglected--for example, in Lublin Wojewodztwos during the last two years there was an increase of 1.5 quintals of grain per hectare, 10 quintals of potatoes, 4 quintals of rape, etc.; in Gdansk Wojewodztwo in the same period the increase was 2 quintals in grain crops, 30 quintals in sugar beets, 15 quintals in potatoes, and 7 quintals in oil plants. A similar phenomenon is noted in Rzeszow, Olsztyn, Bialystok, and other Wojewodztwos.

Disquieting is the fact that in the wojewodztwos which in the past years had already achieved good results we do not observe any marked progress; for example, in Kielce Wojewodztwo the grain crops remain on the level of 21 to 22 quintals per hectare, sugar beets 230 to 250 quintals, potatoes 150 quintals, rape 14 to 15 quintals; in Lodz Wojewodztwo the grain crops fluctuate between 22 and 23 quintals, sugar beets between 220 and 230 quintals, rape 14 and 16 quintals. This also applies to farms in Bydgoszcz, Warsaw, Poznan, Opole, and Katowice Wojewodztwos.

Low [growing] crops on green usable land remain a weak point of the PGR plant production. As a result of unregulated water conditions, about 18 percent of the meadows are not utilized at all and the crops from utilized meadows are small. Of the PGR lands, 19.8 percent are permanent green usable lands, out of which 64 percent are located in Rzeszow, Olsztyn, Szczecin, Koszalin, and Wroclaw Wojewodztwos, while

in the central wojewodztwos the percentage of meadows and pastures is very small.

A very positive phenomenon is the high increase in cultivations other than the main crops; while in 1958 there were about 80,000 hectares of additional clover and lucerne, in 1959 this figure was 95,000 hectares. Additional sowing of seradella increased from 14,000 hectares in 1958 to 39,000 hectares in 1959 and 57,000 hectares in 1960. At present, second-crop cultivations include 103,000 hectares as against 90,000 hectares in 1958 and will reach 114,000 hectares in 1960, including second corn crops. Additional sowing and second crops greatly improve the fodder base and supplement organic fertilizing.

The PGR's as a whole cover the manure fertilizing needs for root and oil crops; calculating 250 quintals of manure per hectare, sufficient quantities are available for about 280,000 hectares. However, in wojewodztwos with lower live-stock inventories there is still a shortage of manure. In comparison with the past year, auxiliary fertilizing increased by about 10 kilograms of pure component in 1959-1960 and exceeds 70 kilograms per accounting hectare of usable land. This is still not enough, and it indicates that the farms do not sufficiently utilize this important factor for improving crops.

The greatest changes in PGR farming are taking place in livestock production, particularly in the form of a considerable increase in the role and number of cattle in the total livestock herds. Since 1957 the number of cattle increased by 24,000; during the current economic year it will increase by an additional 55,000, reaching 654,000, including 328,000 cows. This amounts to 35.8 heads of cattle per 100 accounting hectares of usable land, as against 32.2 this year and 24.1 in 1957. The number of cows reaches 18 head per 100 hectares, not counting cows belonging to employees, of which there are about four heads per 100 hectares of usable land.

Table 3 illustrates the livestock situation per 100 hectares in the individual regions of the country.

Table 3

Livestock per 100 Hectares in Individual Regions

Wojewodz- two Admin- istration	Total on 1 July 1959				Number of "Manure" Heads per 100 Account- ing Hectares	
	Cattle	Hogs	Sheep	Work- ing Hor- ses	1958 r.	1959/60r.
Warszawa	40,5	19,3	-	7,1	45,3	49,8
Bydgoszcz	30,6	37,7	25,5	5,9	40,6	45,9
Poznań	36,1	40,7	26,7	6,3	43,1	45,8
Łódź	32,7	28,0	4,1	7,7	46,8	47,6
Kielce	35,6	9,1	3,8	7,1	48,4	42,2
Lublin	20,1	21,4	5,5	4,9	27,2	27,4
Białystok	29,2	14,5	4,1	4,4	30,4	29,9
Olsztyn	32,1	16,9	6,6	4,3	32,0	31,6
Gdańsk	41,3	26,2	9,8	5,8	41,9	43,8
Koszalin	28,7	25,3	13,3	3,9	28,4	33,6
Świecie	30,0	18,4	12,7	3,4	28,0	33,0
Ziel. Góra	28,6	19,1	16,5	4,4	31,2	35,1
Wrocław	34,4	13,2	15,5	5,0	37,6	40,4
Opole	36,6	19,7	11,7	5,2	40,0	38,0
Katowice	51,6	25,0	-	6,0	51,6	50,0
Rzeszów	27,3	15,3	44,8	2,9	26,1	31,6
Ogółem	32,3	22,9	14,5	4,7	34,3	37,5

The hog livestock herd decreased until this year, reaching about 400,000.

In connection with the increasing market needs, the PGR was given state targets to considerably increase the total hog livestock. At the end of the economic year there will be about 500,000 heads of hogs, which will constitute an increase of 25 percent.

No changes are taking place in the number of sheep, but the primitive breeds of low productivity are being replaced by improved breeds.

The number of poultry is increasing rapidly and in June 1960 will reach over one million, as against 500,000 in 1956 and 800,000 in 1958.

The number of horses dropped by 6,500 as compared with 1956 and next year there will be a further drop of 10,000. It would undoubtedly be proper to cut the number of horses at a much faster rate, but this is prevented by insufficient mechanization, a shortage of tractors and accompanying equipment, the absence of proper types of tractors, the absence of machinery for mechanization of the most difficult processes of production, and the high costs of spare parts. The number of tractors in the PGR's is about 22,000 and is not increasing, but they are rapidly aging. Without a solution to this problem and without the delivery of a sufficient quantity of inexpensive field semi-trucks with low operating costs and an improvement in the trade, supply, and sales network, it will be difficult to liquidate the excessive number of horses.

An analysis of the fodder base shows that the PGS's consume too much concentrated fodder and fodder root crops, with very modest quantities of green fodders, hay, and silage.

There are 36 quintals of silage per cow. Thus, it is most justifiable to introduce highly productive cultivations, such as corn and lucerne, if their good cultivation will actually produce high yields. At present these shortcomings are made up for by concentrated fodders, the purchase of which, according to the plan for next year, will increase by over 45,000 tons.

The yield of milk per cow in 1958-1959 was 2,341 liters, which constitutes an increase of 55 liters over 1957-1958. In 1959-1960 the production of 2,440 liters is expected.

The yield of calves was 79 percent; an increase to 81 percent of the number of cows in 1959-1960 is planned, with a decreased percentage of "culled" [slaughtered?] cows amounting to 1.5 percent in comparison with the 1958-1959 figure (16. percent).

The yield of piglets per sow reached about 9.5 in 1958-1959, as compared with 7.0 in 1955, and an increase to more than 11 piglets is foreseen in the 1959-1960 plan. Losses in piglet decreased in 1958-1959 in comparison with past years by 1.5 percent and at present do not exceed 11 percent.

Other indices of livestock productivity are also increasing--for example, the yield of wool per sheep increased by 0.3 kilograms, that of eggs by four eggs per laying hen.

Sales of PGR products, despite the decreased acreage, show a tendency to increase. Table 4 gives data on state deliveries.

Table 4

Deliveries of Agricultural and Animal Products
for the State

Indicators	1957/58	1958/59	Plan 1959/60
Grains, in 1,000 tons:			
Total	420	540	556
Quality grains	46	65	67
Winter Swedish rape, 1,000 tons	40	33	68
Sugar beets, in 1,000 tons	820	815	760
Live beef and veal, in 1,000 tons	32	34	37
Live pork, in 1,000 tons	61	40	38
Milk, in million liters	455	527	617
Eggs, in millions	28	21	30
Wool, in tons	730	660	700

Between 1957-1958 and 1958-1959 we had a certain decrease in sales in absolute figures, but this follows from the fact that the PGR's have 300,000 hectares less than at the beginning of 1957-1958.

An actual decrease in sales occurred in live pork, amounting to about 33 percent (despite the 55-percent decrease in the hog herd). However, at the same time the PGR sold 200,000 piglets and young pigs, increased the sale of grains by 120,000 tons, and decreased the quantity of potatoes fed to livestock by 250,000 tons, diverting the potatoes to distilleries, which made it possible to reduce the annual compulsory deliveries to distilleries from peasant farms. In this way, this quantity of potatoes indirectly remained in the domestic fodder and market stocks.

The total sale of grains will be 59.3 percent of the grain crops as compared to 58.2 percent in 1957-1958. The grain sales rose from 3.7 to 4.1 quintals per hectare of arable land.

The sales of milk per hectare of usable land will be 370 liters as against 248 liters in 1957-1958.

In 1958-1959 the value of sales and services rose 13.7 percent over the previous year, and the plan for 1959-1960 provides for a further increase in sales of 14.5 percent; per hectare of usable land, 3,833 zlotys were obtained in 1957-1958, 4,357 zlotys in 1958-1959, and in 1959-1960 it is planned to obtain 5,288 zlotys.

There were 23,300 zlotys of commercial production per worker in 1957-1958, 33,600 zlotys in 1958-1959, and in 1959-1960 the figure will be 28,400 zlotys in current prices. The ratio of sales of livestock production to plant production was 103 percent in 1957-1958, already only 81 percent in 1958-1959, and 79 percent in the plans for 1959-1960.

The central regions enjoy the highest value of production per hectare and therefore the highest profits. Agriculture has considerable influence here. The lowering of the production of agriculture will considerably worsen the results from the sale not only of industry but also of fodder stocks in the form of pulp, which constitutes the main advantage derived by farms from distillery production.

In plant production, the sale of grains amounts to 49 percent, that of industrial cultivations to 30 percent--including oil plants, 15.5 percent, potatoes 7.5 percent, vegetables and fruit 7 percent.

In livestock production, 5 percent represent the livestock for breeding, 42 percent that for slaughter, and 52 percent that for sale of products of animal origin. Cattle yield 66 percent of the livestock production and pigs 23 percent.

Expenditures

The introduction of economic accounting lowered the cost of production and therefore the outlays.

One of the most important expenditure items which was decreased was the wage fund, which was the result of a considerable increase in earnings with a simultaneous lowering of the level of employment and an increase in labor producti-

vity. In 1957-1958 the average annual level of employment in the PGR's was about 340,000 persons, falling to 276,000 in 1958-1959 and 267,000 in the plan for 1959-1960. This means the lowering of the index of employment per 100 hectares from 14.9 in 1957-1958 to 12.8 in 1958-1959, and 12.5 in the plan for 1959-1960. White collar employees account for 8 percent of the total employed.

The average annual wage per employee was 14,000 zlotys in 1958-1959 as against 12,400 zlotys in 1957-1958, and the plan for 1959-1960 assumes an increase to 14,500 zlotys.

The share of the wage fund in the total expenditures was 37.5 percent in 1958-1959 and is 39.5 percent in the plan for 1959-1960.

With relation to products sold, the wage fund constituted 53.3 percent in 1957-1958, 43 percent in 1958-1959, and 41 percent in the plan for 1959-1960.

The increase in labor productivity, which is one of the most important factors in the profitable management of the PGS's, seems to be a sufficient foundation for a further improvement in earnings and a revision of the Collective Labor Agreement (Uklad Zbrowy Pracy), which even in the last revised version does not create sufficient incentive to struggle for an increase in production.

Any further radical decreases in employment without a decisive development of mechanization and with increased intensification would not be proper. This is evident from the fact that at present the highest production and financial indices are shown by wojewodztwos with a comparatively high level of employment.

The costs of maintaining capital intact--that is, the costs of current repairs and depreciation--which constitute 14 percent of the expenditures in 1958-1959 and as much in the 1959-1960 plan as against 15.5 percent in 1957-1958 constitute a second important group of outlays. The lowering of this group of costs by an average of about 130 million zlotys constitutes an expression of correct economy, but in certain farms it is often a result of a tendency to obtain profits with the least effort.

A positive manifestation in this group of costs is the allocation this year of considerable sums for current and capital repairs of regulating installations.

In the remaining costs certain changes took place: expenditures for social insurance decreased because of a change in rates; expenditures for the purchase of seeds and seedlings dropped by over 30 percent because of increased on the spot production; the 35-percent decrease in livestock purchases was the result first of all of better production and an absence of horse purchases, and also of the insufficient fodder base. The increase in production resulted in a 12-percent decrease in fodder purchases. Purchases of fuel, artificial fertilizers, and the remaining materials did not undergo any major changes. Administrative expenditures were cut by about 45 percent.

Social and cultural expenditures and those for the safety and hygiene of work rose from 130 million zlotys to 134 million zlotys in 1958-1959 and 142 million zlotys in 1959-1960.

Financial Results

The plan for 1959-1960 contains a symbolic profit of a few million [zlotys]. This result stems from the attainment of profitability on 51 percent of the farms, with the still assumed deficit of 49 percent of the farms, as against 35 percent of farms profitable in 1958-1959 and 15 percent in 1957-1958. In 1958-1959 a factory fund will be created in over 3,000 farms, half of them being farms which lowered the planned losses. Profitability according to wojewodztwos is as follows: the first group consists of wojewodztwos which had already reached a profit in 1958-1959 and continue to increase it in the plan for 1959-1960; they are the WZ [Wojewodztwo Zarzad; Wojewodztwo Administration] PGR's in Warsaw, Bydgoszcz, Poznan, Lodz, Kielce, and Katowice. The second group of wojewodztwos consists of those which in 1959-1960 plan for the first time to attain a profit as a whole: Lublin, Gdansk, Wroclaw, and Opole. The third group are wojewodztwos which are already close to accounting equilibrium: Olsztyn, Rzeszow; and in the fourth group--the still deficit wojewodztwos--are Bialystok, Zielona Gora, Szczecin, and Koszalin. However, these wojewodztwos too will probably become profitable next year.

An analysis of the results of 1958-1959 and the plan for 1959-1960 proves that the PGS's have made a big leap forward,

but the production indices show that the PGR level is still low and the progress achieved placed them on a development level which can only be called a start toward creating a truly large-scale market production. Thus, it is necessary to consider what production reserves there are and what is hindering a more rapid development of the PGR's.

If we accept a rough division of the PGR's into two groups-- a) farms with a higher degree of intensification; and b) farms with a low level of intensity--the question arises first of all at what rate the farms of group "a" could be raised to the level of high intensity and group "b" raised to at least an average level.

It seems that this will depend to a large extent on whether the wojewodztwo PGR administrations and the PGR inspectorates will be able to make a proper distribution of needs and effective investments and properly concentrate the resources in definite farms.

The outlays for intensification must meet with conditions in which they could be "consumed" with a proper result. This depends primarily on whether trained specialist, personnel, roads, auxiliary installations, and some minimum level of soil culture will be available on the spot. It cannot be permitted--as often happens--that cow shed stand empty because fodder production is insufficient.

Thus, the concentration of resources must be reasonable and the farms properly selected. In group "a" farms, the concentration of resources consists mostly in filling gaps in production factors, which hinder full economic development. This applies not only to construction or regulation but also to mechanization of the processes of production, determination of a proper direction of production, and training of management and personnel. The main shortcoming of these farms is the fact that they are usually small, with buildings suitable for nineteenth century production patterns, with conservative personnel and management adhering to routine. It is often difficult to convince the directors of these farms even about the need to use a block for carrying heavy loads in warehouses, not to mention over-all mechanization. Certainly the PGR's cannot afford broad and total mechanization of all farms, but it would be proper to equip at least one farm in each powiat with a rather extensive set of machines, tractors (in order to considerably reduce the number of horses), repair facilities, and supplementary

buildings and installations. It would be worthwhile to send the directors of these farms to the USSR, East Germany, Czechoslovakia, or other countries, with a definite task of studying specific fields of farming to prepare them for a change in farming methods and for application at home of what they learned. This or some other well prepared method must be used to break the routine and backwardness of those PGR's which have already reached a certain level of intensification but see no further reserves or ways to progress.

However, the main weakness of the PGR's lies not in this group of farms but in the group which we called "b." These are farms located on very difficult terrain. The classifications of the expected effectiveness of outlays in these farms and the determination of the proper stages of their development and correct concentration of resources and experts seems to be the basic task.

Much has been said and written about the proper choice of directions of production in the PGR's in accordance with the local conditions. In many farms correct changes took place in this field, by several factors hinder the solution of this problem. Firstly, there are the constant attempts by the administration to direct the production of the farms. In this respect, the principle of autonomy of the farms is very often violated. If this is done by expert agriculturalists prompted by the desire to increase production, such intervention backed by persuading the directors of the farms is indispensable and can only help the development. But unfortunately interventions are often not backed by any agricultural argument and only introduce chaos; although a correct problem is often involved, it is not adjusted to local conditions. Secondly, wrongly understood full autonomy of farms under conditions where the level of cadres is weak leads to a situation in which each farm scatters its production and becomes a "Noah's Ark," in which there is a little of everything. Is it possible to speak here about large-scale market production? Certainly not. There can be no specialization under such conditions, and specialization is indispensable for adapting the production to the environment and to large-scale market production.

Specialization of production must be backed by high-level technology and agricultural skill, and for this reason it did not succeed in the PGR's in the past period. But the use, for example, of a closed cycle in pig breeding from a sow to a fattened pig is a costly artisan method and could be

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reasonable only if the fattened pig differed as much from other pigs on the market as a suit made by a first-rate tailor differs from a ready-made suit. It would be much cheaper to adapt some large breeding installations with proper buildings for sows to mass production of young pigs and to specialize fattening and bacon-producing centers by organizing truly modern methods of fattening.

The time has already come in which independent farms, particularly those located close to each other, should establish cooperation and thus organize their production, which procedure would certainly give large savings, better utilization of resources, and actual adaptation of the direction of production to local conditions.

Thus it would be necessary to change the organization forms--for example, by a wider use of cooperation or by the application of new forms such as a council of management of several farms, an association of several farms, or a powiat union, while retaining the principles of economic accounting.

Rigid and detailed plans of farming constitute an obstacle to the necessary flexibility of current solutions. Since such plans are more and more prevalent in the PGR's, it is necessary to change the method of preparing them so that the crop rotation introduced will retain its positive influence on production and in order to prevent obstacles to any necessary revision of the structure and organization of production.

Among the problems more closely connected with the present state of PGR production, we see the most important elements of development in the following;

a) More rapid development of cattle livestock and attainment in the shortest possible time of about 45 to 50 accounting heads per 100 hectares of arable land (the 1959-1960 plan provides for about 40 heads), which will make it possible to considerably raise the level of fertilization in order to improve the yield from the soil.

b) A considerable increase in cultivations other than the main crop--for the same purpose and to supplement the fodder base. The main target is that each year, particularly on poorer soils, at least 15 percent of the second crops and additional sowing should be plowed as green fertilizer.

c) Determined implementation of the assumed pace of regulation in the PGR's and an increased pace of current repairs of regulation installations--and thus the attainment of a definite improvement in crops from meadows and pastures.

d) Allocation of 20 to 30 percent more resources than at present for mineral fertilizers and mechanization.

e) The introduction of new and highly productive breeds and species of plants and animals and modern agrotechnology and zootechnolgy on the basis of experience of countries leading in agriculture. This requires constant observation of progress in the world, for example, in Czechoslovakia, East Germany, and the USSR, and absorbing of these experiences. For this purpose it would seem desirable to organize an exchange of trainees, mostly of experts directly employed in the field, who would be given direct tasks of implementation of experience gained in managing a farm or several farms, or in a specific branch of production.

At the present moment it is first of all necessary to organize a modern, highly efficient, large-scale production of pigs, particularly the fattening of pigs, to enable the PGR's to put additional large quantities of live pork on the market in a short time.

The taking of such measures toward further progress becomes especially essential in view of the fact that the development of agriculture as a whole tends in the direction of large-scale production, for which patterns must be created as soon as possible. The PGR's must cope with these new tasks much faster than was originally planned.

As was already mentioned, the development of the PGR's does not proceed without errors and difficulties, but it can be judged from the undubitable achievements of the last few years that the PGR's will overcome these difficulties, correct the mistakes, and fulfill their targets.

POLAND

Problems of Modernizing Construction Work in the 1959-1965 Period

[This is a translation of an article by B. Kierski, J. Witkowski, and M. Zubel-ewicz in Inwestycje i Budownictwo, Vol IX, No 10, October 59, Warsaw, pages 17-23; GSO 3466-N]

According to current estimates, the outlays for construction-assembly production in 1959-1965 will increase considerably. In 1965 this increase will amount to 76.2 percent in comparison with 1958 and 46.7 percent in comparison with 1960. The rate of increase in outlays for construction in this period is illustrated in Table .

Table 1

	1958	1959	1960	1961	1962	1963	1964	1965
Percentual increase in outlays for construction-assembly work, overall in comparison with 1958	100	112.3	120.0	129.7	140.0	151.5	164.3	176.2
As above, in comparison with 1960	-	-	100.0	108.0	116.6	126.2	136.8	146.7

The fulfillment of these targets will contribute to a further considerable expansion of Poland's industrial base, create possibilities of utilizing the strongly increased supply of workers on the labor market after 1965 and of raising the standard of living of the population.

In regard to housing in 1961-1965, the construction of 3.2 million rooms is planned, of which 2 million are of the urban and settlement type. This means an increase of more than 56 percent in relation to the 1956-1960 plan, which pro-

vides for the construction of about 2 million rooms, including 1.2 million of the urban and settlement type.

The employment balance up to 1965 shows a shortage of manpower. This shortage will be particularly acute in the next Five-Year Plan. This will be caused by the entrance on the labor market of the wartime age groups. As a result, the phenomenon which should normally appear in industrial development--a disproportion between the rise in employment in various fields of the national economy and the rise in targets--must be even more pronounced. Construction in this period can count on an increase in employment up to 140,000 workers. Thus, if the increase in construction targets in 1965 amounts to more than 46 percent in comparison with 1960, employment in the same period will increase only by approximately 22 percent. This gap must be filled by a suitable rise in work productivity. In this light, the fulfillment of real construction targets depends on the solution of several basic problems.

Limited employment possibilities in the period under discussion call attention to the necessity for a maximum rise in qualifications of those presently employed as well as ensuring suitable standards for newly engaged cadres. Training of construction workers is the condition for the proper fulfillment of technical progress and modernization targets as the main factors in diminishing the labor wastage of construction processes, in increasing productivity, and in shortening the time of construction cycles.

The industrialization of construction work also brings about changes in the methods of organization and management. Consequently a higher professional level of appropriate management cadres will be required.

It should be noted that technical progress and the mechanization of processes should have a multilateral character and not be limited to certain processes, as is now the case (for example, work in the raw stage).

Large unused reserves are to be found in the execution of various kinds of finishing work. The higher the share of a given factor in the finishing work total, the larger are the reserves.

In housing construction, the most important factor in finishing a building--both from the point of view of consider-

able labor consumption (together with elevations and improvements, approximately 19 percent) and its high share in the total cost of the building (approximately 10 percent)--is the plaster work. The cost of carpentry work fluctuates between 11 and 13 percent. Floor laying constitutes approximately 12 percent of the total construction cost, with a relatively high labor consumption approximating 8 percent. Labor use in erecting partitions amounts to approximately 4 percent of the total construction work. The cost of these partitions is about the same. Painting constitutes approximately 6 percent, while the remaining work comes to about 7 percent.

Finishing work takes up approximately 47 percent of the man-hours required to carry out the total construction of a given object, which means that this labor consumption and costs must be reduced.

The creation of an adequate production base of building machinery is an indispensable condition for industrializing construction. The development pace of the machine reserve stock is at present unsatisfactory in relation to the needs of construction work resulting from investment targets. Therefore, particular attention must be paid to problems connected with the expansion of industries producing machinery and other equipment needed for construction work and for the construction materials industry.

In order to facilitate the fulfillment of construction targets by progressive methods in the transition period, supplies from and cooperation with the people's democracies should be relied upon. Possible transactions in this field with capitalist countries should concern the purchase of suitable highly productive machines and equipment--in principle, prototypes. Apart from the use of modern materials, particular attention should be given to a wide application of assembly methods of large-size components.

It is anticipated that the industrial construction work, using assembly methods from prefabricated reinforced concrete components and steel structures with prefabricated concrete frames, will encompass 24.5 million cubic meters of volume, which means an increase of 190 percent in comparison with 1958 and 145 percent in relation to 1960.

Targets set for this period by the Building Department (resort budownictwa), the chief executor, are shown in Table 2.

Table 2

	1958	1959	1960	1961	1962	1963	1964	1965
Volume of objects made from prefabricated components in million cubic meters	8.5	9.0	10.0	11.8	13.2	16.3	20.0	24.5

It is also assumed that in 1965 one million cubic meters of objects made of monolithic concrete in sliding or movable molds will be constructed.

In housing construction of the urban and settlement type, the share of industrialized methods in 1965, according to current estimates, will amount to over 31 percent (146,000 rooms) of the newly built rooms, which is more than 11 times that of 1958 and more than four times that of 1960, as is shown in Table 3.

Table 3

	1958	1959	1960	1961	1962	1963	1964	1965
Total number of rooms, in 1,000	230	270	314	335	366	399	435	465
Rooms built by industrialized methods, in 1,000	13	22	36	53	79	106	128	146
Percentual share in total number of rooms	5.5	8.1	11.4	15.8	21.6	36.9	39.4	31.4

The large majority of rooms will be built by enterprises subordinate to the Building Department, while the methods applied will be those of assembling houses from large-panel and large-block components, and of erecting houses with a diagonal formation of monolithic concrete walls made in sliding or movable molds.

It is also assumed that during the period under discussion the same methods will be introduced in social, public utility, administrative construction work, etc. In regard to the methods of work, they will be similar to those applied in

housing construction, while the selection of a suitable method of achievement will be decided by economic results and the technical-organizational efficiency of the builder of an object.

Industrialized methods will have particular importance and application in areas having a large building concentration and suffering from a shortage of labor (such as Silesia and Warsaw).

In housing construction, economic problems deserve priority consideration:

1. Lowering the costs of this construction in relation to work done by traditional methods. Thanks to a better organization of processes than in previous years, the costs of these methods in certain building areas during the current year are leveling off with the costs of traditional construction, as is shown in preliminary analyses.

The costs of this construction should decline in 1965 by approximately 12 percent in comparison with constructions carried out by traditional methods. This will depend on over-all technical-organizational preparations and on the extent of the enterprises for which these methods are gainful. It is assumed in principle that for settlements or groups of buildings of a volume of more than 50,000 cubic meters the application of one of the aforementioned methods of assembling large-size concrete elements is appropriate, depending on the skill of the builder, the technical reserve stock, and the material base in a given area. As the skill of the builders improves and suitable equipment and machines are provided, a regular increase in the share of large-panel construction is anticipated.

2. A substantial decrease in labor outlays in the construction area. Specifically, if the present average labor outlay per cubic meter of building volume fluctuates between 6 and 10.6 man-hours, with the application of industrialized methods the following achievement is anticipated in 1965:

In large-panel construction work	3.2 man-hours
In large-block construction work	4.0 man-hours

This does not include the labor required for the production of large-size components.

It should be mentioned that as a result of an anticipated substantial rationalization of traditional methods (mainly, the mechanization of finishing work) in this period, a decrease will also take place in labor outlays, but not to such an extent as in regard to the assembly methods of houses made from fully finished large-panel and large-block components.

Present experience shows that the application of industrialized work methods results, according to rough calculations, in a decline in labor consumption of approximately 56 percent in the construction work in the raw stage in relation to the labor consumption of traditional system construction work, which means an over-all decline of about 30 percent in labor consumption for the construction of the entire building.

Outlays for finishing work are also considerably lowered.

3. This leads to a shortening of the production cycle by 20 to 40 percent, which, together with the decrease in labor consumption and increase in labor productivity, constitutes the third basic trend.

4. Lowering the volume of the walls and the weight of the building:

	Kilograms per Cubic Meter of Building Volume (Approximate)
In large-panel construction	200
In large-block construction	400

The present weight per cubic meter of building volume constructed by traditional (artisan) methods fluctuates between 500 and 600 kilograms, but it is planned to lower this weight to 450 kilograms in 1965, thanks to the rationalization of these methods. This would mean a decrease in weight in 1965, regarding the traditional methods, of 55 percent in large-panel construction work and 10 percent in large-block work.

It is impossible to achieve the above outlined plans of technical progress without an expanded production of prefabricated components and the introduction of fully mechanized production processes. The planned scope of industrialization in the field of housing and industrial construction will re-

quire an additional supply of approximately 2.5 million cubic meters of prefabricated concrete components in 1965. An expanded production of prefabricated components is therefore extremely important and requires advance announcement, in addition to the other problems outlined above. It is closely connected with industrialization, constitutes a sizable problem, and requires separate treatment in the economic plans of the 1959-1965 period.

The introduction in a large degree of industrialized methods in construction work, apart from providing a production base for concrete components, requires that the prefabrication plants and building areas be furnished with heavy assembly equipment and special means of transport adapted to carrying components.

Neither the regular development of industrialized construction work nor progress in traditional construction work can be achieved without basic changes in the equipment structure--i.e., adequate supplies of machinery and equipment--or without their proper utilization through suitable organized mechanization of work.

In this connection, two principal trends in the mechanization of construction work are emerging:

The first trend is closely connected with the introduction of modern technology in construction work, especially the assembling of large-size prefabricated components, of industrial installations and other production equipment. This trend represents an inseparable factor in technology and in the organization of work performed by industrialized methods. In construction work of this type, mechanization must be complete and comprehensive. This relates, of course, to the proper, so-called second degree, industrialized construction.

The second trend is the endeavor to mechanize only the technological processes and activities, apart from the mechanization or traditional performance of the remaining activities. This naturally concerns primarily heavy, labor-absorbing work on a mass scale, such as earth moving, with particular emphasis on land improvement, concrete work, unloading, and artisan work, and, in the last category, especially finishing and installation work.

Attempts should be made to remove the disproportion in the mechanization of earth moving work in various construction

organizations and to eliminate as soon as possible the irregularities existing there. Earth-moving work on road and railroad construction, particularly suited for mechanization in a large degree, do not at present achieve even one half of the mechanization scope applied in housing and industrial construction. There exist, at the same time, unjustifiable trends toward a further intense mechanization of earth-moving work in housing construction at considerable financial expense, but neglecting almost entirely the mechanization of other processes. The main emphasis should therefore be put not on a further development of processes already mechanized to the profitable limits but on an increase in the mechanization of processes which are now either unsatisfactorily mechanized or not at all.

The large percentage of workers employed in all kinds of unloading (approximately 20 to 25 percent of the entire construction labor force) calls for the initiation and intense development of the mechanization of these processes, both in building areas and at intermediate points on transport routes.

This concerns in the first place granulated materials which constitute the principal mass to be transported and unloaded in construction work.

The main effort, although still unsatisfactory, in the previous period was aimed at the rationalization of raw stage work in general construction. The pace of rationalization achieved in raw stage work is, unfortunately, not matched by the progress in finishing work. The lack of attention to finishing work made its discrepancy with the work in the raw stage more acute. Such a situation, taking into account the frequently poor organization of work, led in many instances to a loss of anticipated gains of the whole enterprise. These processes should be coordinated and run harmoniously.

Substantial effects in regard to lowering labor consumption and decreasing the number of qualified workers are connected with the mechanization of specific activities. It is therefore necessary to pay attention to the problem of mechanization of the finishing and installation work as well as the general construction work. The scope of mechanization should be substantially enlarged, not only in regard to work as yet inadequately mechanized but also to other work hitherto carried out by traditional methods in various branches of construction.

The achievement of the following mechanization indices of the main assortments of construction-assembly work is planned for 1965.

1) Earth-moving work should reach a mechanization index of about 80 percent, with a clear tendency toward comprehensive solution of all problems, not limited to mechanical excavations, while suitable sets of auxiliary equipment, appropriate means of transportation, and efficient organization are still lacking.

2) Vertical transportation in construction work is now almost fully mechanized with the aid of various hoisting devices. Progress in this field can be achieved by replacing, in economically and organizationally justifiable cases, vertical transportation with a vertical-horizontal one in the form of tower cranes. It is planned to increase the use of these cranes to an extent that would allow approximately 30 percent of the vertically movable mass in traditional construction to be lifted and then delivered horizontally to its assigned place. At the same time, vertical transportation in industrialized construction is to be entirely mechanized with the introduction of tower cranes and heavy self-propelled cranes.

3) Total unloading in construction work should be at least 30 percent mechanized. The unloading of granulated materials, which appear on a mass scale and are the easiest to handle, should reach a mechanization index of about 40 percent. The carrying of loose cement will also contribute to a decrease in the scope of unloading work. It is anticipated that 3 million tons of cement will be carried in 1965 by road and rail transport (automotive cement carriers, cement trailers, special railroad freight cars).

4) Mechanization of artisan processes, finishing and auxiliary work (especially in regard to jobs now practically mechanized) should achieve the following indices:

	<u>Percent</u>
a) Sizing	75
b) Oil painting	65
c) External plastering	60
d) Internal plastering	60
e) Grinding "lastrico"	80
f) Floor scraping	75

In addition, the mechanization of other jobs, mechanized so far in a very small degree or not at all, should be technically prepared and introduced. Above all, the following work groups should be mentioned in this connection:

- a) Installation of sanitary equipment and central heating
- b) Electric installation work
- c) Carpentry
- d) Joinery
- e) Locksmith work
- f) Tin-plating
- g) Auxiliary work in assembling, etc.

In order to meet these targets, it is necessary to furnish the construction industry with adequate number of basic heavy machines and to introduce new mechanized equipment and tools, not used as yet to any large degree. Apart from ensuring the quantitative supply, the introduction of modern multi-use equipment should be undertaken in a broad type and size assortment to facilitate the economical use of the most suitable equipment for appropriate varieties of work.

In regard to excavating machines, a substantial number of light excavators with a scoop capacity of 0.2 to 0.3 cubic meters, on tires or universal undercarriages permitting the mounting of wheels or semicaterpillars, and able to develop an adequate traveling speed, should be introduced into construction work. Also necessary is the introduction of mechanical digging devices as auxiliary equipment for tractors. Excavators assigned to construction work should be equipped with a full assortment of auxiliary implements facilitating their use on various kinds of earth-moving work and as hoisting or unloading devices. An increase should also be planned in the application of a wide assortment of multi-vessel excavators, mainly for various kinds of land improvement, cable and pipeline work.

Another necessity is the broadening of the type and size assortment of self-propelled cranes, on both wheels and caterpillars, by bringing in cranes of a higher carrying capacity and longer reach, adapted to rapid travel on public roads and equipped in specific cases with hydraulic-type supports to facilitate quick and easy shifts on work positions. Tower cranes should be light and easy to transport, self-mounting, and partly furnished with remote control equipment.

Apart from currently manufactured tower cranes, traditional construction work necessarily requires the use of smaller cranes of 10 and 20 Tm [not identified], while larger cranes are needed for industrialized methods and industrial construction work.

In regard to bulldozers, an attempt should be made to furnish them with hydraulically operated blades (bulldozers with an angled blade--angledozers) and with additional loading equipment, and also to initiate the use of bulldozers on wheels.

Special emphasis must be laid on the widest possible use of scoopers and the introduction into construction work of modern attachable scoopers hydraulically powered or self-propelled.

Simultaneously, many kinds of auxiliary equipment fitted onto caterpillar and wheel tractors (hoisting, bulldozing, loading, leveling equipment, etc.) should be put to use. This would make possible their utilization as tractors and as carrying or propelling machines for light and relatively inexpensive auxiliary equipment. Even an occasional use of this equipment permits a mechanized performance of a number of small jobs, without burdening the enterprise at the same time with high amortization costs in cases where not enough work is provided for full [-time] utilization.

The considerable labor consumption of the unloading work indicates the necessity of introducing a large number of various mechanized unloading devices. This applies particularly to granulated materials, which constitute the major part of construction materials subject to unloading.

The accumulation of unloading operations of granulated materials in regions where construction work is concentrated and the resulting serious unloading difficulties on the main tracks of railroad stations (for example, Warsaw, Krakow, Silesia, and Lodz) clearly pose the problem of organizing central unloading points with their own sidings, furnished with permanent installations of comprehensive mechanization, suitable warehouses, and means of transport. This would simultaneously solve the problem of assuring continuity in the supply of granular materials during peak transportation periods and allow winter stockpiling.

In regard to mechanization of the unloading of granular materials in construction areas, the widest possible application of mechanical shovels as the primary means of mechanization should be initiated. Even the introduction of this very simple implement, so useful in construction work, encounters serious difficulties. In the remaining unloading operations, other technologically justified devices can be used, depending on conditions--such as transporters with spiral chutes, single- or multi-vessel loading devices, equipment for unloading freight cars, etc.

The variety of unloaded construction materials and the various conditions of their loading and unloading make it necessary to introduce universal light installations, used as auxiliary equipment of the means of transport. It should be assumed that by 1965 one half of the trucks will be furnished with such equipment of a carrying capacity up to 500 kilograms (for example, equipment similar to the hydraulic installations of the Neal Lorry Loader type).

The large share of finishing and auxiliary work and the low degree of its mechanization point out the direction of mechanization and emphasize the great possibilities of saving manpower if this work is adequately mechanized. The threatening acute shortage of manpower dictates a decisive change through furnishing the construction industry with large numbers of various modern implements and mechanized installations.

It is estimated on the basis of preliminary analyses that the effectiveness of outlays for relatively small implements and mechanized installations is considerably higher than the effectiveness of outlays for the mechanization of basic construction processes. The productivity of teams equipped with mechanized tools can increase 1.5 to 2.5 times. However, the principle of a comprehensive concentration of mechanized equipment should be adopted, gradually supplying it to certain specialized brigades, worker groups, and, finally, entire enterprises, suitably changing the work organization and planning appropriate parallel rises in labor productivity. The currently practiced fragmentation of the relatively small number of mechanized tools among the largest possible number of organizational units has not produced practical results, because it only facilitated a few jobs within the entire traditionally executed process.

Mechanized tools wrongly applied, poorly handled, quickly damaged, and deprived of adequate technical care without a

chance of repairing have been filling storage rooms or were turned into scrap.

All this contributed to a harmful opinion about the unsuitability or poor quality of tools generally recognized as good and successfully applied by our neighbors. As a result, during the past three years there was no increase in the mechanization of finishing processes in a number of cases, and even occasionally sizable decreases occurred (for example, in mechanical plastering). Consequently, the introduction of new, never before used mechanized tools should be supervised by the Institute of Construction Work Organization and Mechanization (Instytut Organizacji i Mechanizacji Budownictwa) in regard to selection, practical checking of performance and productivity, and direct supervision in the initial period of their practical application.

According to an apparently correct view, the introduction of modern equipment should rely in principle on imported model series of well known tools, whose quality and purposefulness in application are above discussion. All shortcomings may then be ascribed only to poor handling and mismanagement.

The fulfillment of such targets will require a delivery of about 90,000 various domestic and imported mechanized tools to the construction industry during 1960-1965.

The proper development of construction work mechanization depends largely on a reliable domestic production base, in regard to both machines and mechanized equipment and tools. It will be impossible to fulfill these tasks if the domestic industry does not strive to expand fully the assortment of construction machinery and fails to increase its efforts toward the earliest possible production start of new types of machinery. This applies, above all, to such basic factors as the production of heavy trucks and dump trucks of 8 to 10 tons carrying capacity, heavy caterpillar tractors of 80 to 100 horsepower, and fast road tractors on wheels of approximately 140 to 180 horsepower. Apart from their independent usefulness, these machines form the indispensable base for further regular development of the construction machine industry, facilitating the production growth of a number of new machines and equipment. On the basis, for example, of a caterpillar tractor, production of bulldozers, scoopers, loading machines, ditch excavators, special cranes, etc., can be developed. Heavy wheel tractors, can--apart from trans-

portation tasks--aid in the production of wheel bulldozers, heavy wheel cranes, and various kinds of loading and unloading equipment.

Although the program of starting production of new machines is seriously contemplated, all starting dates for serial production are very distant.

A separate problem is to begin domestic production of light single- and three-phase electric engines for various kinds of tools and mechanized equipment. Engines currently produced are not sufficiently durable and resistant to overloading. Their great weight makes them ineffective in easing and alleviating manual labor.

In addition to a substantial increase in the number of machines and mechanized equipment, the management policy in the equipment field requires basic improvements in order to create conditions for a progressively better exploitation of the machinery stock serving the needs of the construction industry.

The productivity of construction machines should increase an average of approximately 40 percent by 1965 so as to achieve the following productivity in the various machinery groups:

Excavators--up to 1,000 cubic meters per cubic meter of scoop

Bulldozers--up to 1,000 cubic meters per horsepower

Scoopers--up to 6,400 cubic meters per cubic meter of the box

Tower cranes in traditional construction--3,750 tons per ton of carrying capacity

Tower cranes in industrialized construction--1,600 tons per ton of carrying capacity

The following must be done to meet these targets: the setting of new, detailed norms, specified according to equipment and working conditions, and according to single and annual achievement for construction machinery; adequate numbers of spare parts for the machines must be ensured and special means of transport for moving these machines must be provided.

One of the conditions ensuring a rise in machine production, apart from the introduction of typical equipment and shortening the average age of the machines, is the proper organiza-

tion of technical reserve stock. It is suggested in this connection that one or more bases should be organized--in wojewodztwos or district--to furnish heavy construction machines in a given region for all general construction enterprises, and for specialized enterprises in periods of their peak requirements.

A basic premise of proper equipment management is to make the effort to adhere strictly to the principle of typified equipment, in regard to both domestic production and imported supplies. An indispensable condition here is the restoration of the balancing of basic construction machines and the creation of a coordinating system for the domestic production of these machines in close relation to import planning. Also necessary is the adaptation to the construction industry's needs and specifications of the existing rules pertaining to the husbandry of surplus construction machines (decree of the Presidium of the Government No 788/56).

Supplies of transportation equipment most suited to the needs of construction work are also indispensable for efficiency and the achievement of anticipated results. The structure of the transportation media should be subject to constant change in the direction of an increase in the number of heavy 8- to 10-ton units with high-pressure engines on the one hand and light 0.5- to 1.0-ton units on the other.

The current high prices of equipment and transportation media do not favor an intense expansion of work mechanization. The costs of purchasing machinery are disproportionately high in relation to the value of manual labor. This is confirmed by the following examples:

The value (purchase price) of a medium-size 0.7 cubic meter excavator in the Soviet Union is equal to operator's wages (including dues) for a seven-year period; In the United States--to operator's wages for 3.6 years; In Poland to operator's wages for a period of about 30 years (purchase price of KU-0.5 cubic meter and 0.75 cubic meter excavator produced in the Warynski factory is 660,000 zlotys and average excavator operator's wages 2,000 zlotys per month).

The price of a station wagon type automobile on a "Warsaw" undercarriage is 115,000 to 125,000 zlotys, depending on type, while a truck of the "Star" type costs 95,000 zlotys.

Another factor obstructing mechanization is the often incorrectly fixed rates for servicing machines and equipment. This frequently leads to avoiding the use of mechanized equipment in cases where work traditionally executed is more profitable to the worker than the operating of mechanical equipment.

Under the present financing system, serious difficulties exist in adding to the machine stock large numbers of new machinery, which--in accordance with regulations--should be purchased out of the enterprise's own resources. On the other hand, the old system of equipment purchases in the form of a budget subsidy eliminated the incentive to establish a proper machine buting and managing policy. Incorrect estimates of the value of the machine stock and the resulting amortization figures do not create suitable conditions for the development of mechanization.

A new financing system should provide the proper economic incentives in the outlined directions and assure the enterprises the possibility of complementing the machine stock within a short time.

The fulfillment of the outlined targets will certainly demand an increase in investment outlays.

Mechanization on a wide scale necessitates intense, long-range training of specialist cadres to operate the machines and of engineer-mechanizers.

Simultaneously, a specialist cadre must be built up to service the equipment bases.

Footnote

- 1B. Kierski and M. Zubelewicz: "The Problem of Labor Productivity in Housing Construction," Gospodarka Planowa, No 5, 1959.

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Railroad Transport Service for the Metallurgical
Industry of Upper Silesia

[This is a translation of an article by
Dr T. Rzebik in Przegląd Kolejowo-Prze-
wozowy, Vol XI, No 11, November 1959,
Warsaw, pages 283-285; CSO: 3467-N]

Transport influences the volume of production, of commodity turnover, and of material supplies, and conversely, these manifestations of economic life exert a decisive influence on the development of transport. In a planned economy it is not permissible to underestimate the importance of transport. Transport has often constituted a bottleneck in the national economy and caused serious difficulties in the economic life of the country.

Transport has a very strong influence on the location of industry. This influence is evident especially today in the period of struggle to lower production costs. Excessive distances from production plants to bases supplying them with basic raw materials increases the cost of transport and therefore increases the cost of production. There is a tendency to locate new production plants in areas which constitute for them the bases of supply of basic raw materials, fuels, and auxiliary materials. In determining the most suitable place for the construction of a new production plant, a balance of transport is prepared and the volume of hauls is calculated separately for material supplies and for the finished products. If raw materials and fuel constitute a large item in the hauls of the planned plant, it will be more economical to locate it on the raw material or fuel base.

The problem of location of industry in the socialist system is dictated first of all by economic and social factors. The purpose of this location is to eliminate waste in transport work and thereby lower the costs of hauls and equalize the economic level of individual regions by proper distribution of productive plants.

Hauls by Standard-Gauge Railroads

The metallurgical industry is concentrated mostly in Upper Silesia, in three districts: Gliwice, Chorzow, and the Dabrowa Basin.

The Gliwice and Chorzow districts are advantageously located with regard to the supply base. They possess rich deposits of burning and coking coal. Opole in Silesia supplies limestone and lime and the Bytom-Tarnogora region supplies dolomite. Convenient supply conditions are also enjoyed by the Dabrowa Basin, with deposits of burning coal, limestone, dolomite (Zabkowice), and iron ores in the Czeszochowa-Kielce region. In addition, there are a few other metallurgical centers, such as Czeszochowa, Starachowice, Ostrowiec, Swietokrzyski with iron ores and excellent melts (the Staropolski region). After the liberation the Szczecin, Bobrek, 1 May, Labedy, Malapanew, and General Swierczewski foundries were added to the Polish iron industry. In this way the total production of our metallurgy increased by joining the production of these foundries with the production of foundries located in the former Polish territory (Pokojski, Kosciuszko, Florian, Batory, Baildon, Ferrum, Jednosc, Buczek, Sosnowiec, Dzierzynski, Zawiercie, Bierut, M. Nowotko, and Starachowice foundries).

The present concentration of the metallurgical industry on the fuel bases in the Silesian industrial region creates considerable difficulties to be overcome by transport. In this region, about 50 percent of the total mass of goods is shipped on the PKP [Polskie Koleje Panstwowe; Polish State Railroads] lines and the deliveries to the region constitute 26 percent of the total goods transported by the PKP. The following figures illustrate the volume of hauls: in 1953 the production of pig iron of the Silesian region alone constituted about 1.7 millions tons, that of steel about 3 million tons. This created a great concentration of hauls in metallurgy supplies in the region of the Katowice DOKP [Dyrekcja Okregowa Kolei Panstwowych; District Administration of State Railroads].

For the production of the above quantities of pig iron and steel it was necessary to transport about 8 million tons of charge materials for the big furnaces (ore, coke, limestone, coal for foundry coking plants); about 4 million tons of semifinished products in inter-foundry turnover; about

one million tons of technical and auxiliary materials, and materials of investment supply in connection with the development of foundry plants.

During 1953, the Silesian region railroads transported--disregarding supplies for other industries of that region and foodstuffs for the population--over 16 million tons of materials necessary to ensure iron foundry production. In addition, 7 million tons of charge coal were transported to supply the coke-chemical industry as well as 5 million tons of heating coke. The total foundry hauls of that year amounted to 27 million tons.

In connection with the 1958 increases in the production of that region in the form of 2.5 million tons of pig iron, 4 million tons of steel, and 6.5 million tons of coke (apart from the production of foundry coke plants), the foundry hauls in the GOP [Gornoslaski Okrek Przemyslowy; Upper Silesian Industrial District] increased to about 37 million tons.

The foundry hauls expected in the long-term plans of metallurgy development will amount to about 50 million tons in 1965. A large concentration of the coal and chemical industry in that region requires that these industries be supplied with a large quantity of materials and that coal and finished products be distributed in the opposite direction.

The heavy passenger traffic in commutation to work, mass sport and artistic events, etc. also contributes to the transport difficulties in this region and to the limitation of the carrying capacity of the lines.

The metallurgical industry occupies the second place after the coal industry in volume of railroad hauls. The diversity of materials involved in supplies and sales, the two directions of the hauls, and the inter-foundry turnover result in the fact that foundry hauls are classified among the most difficult in railroad transport.

For foundry hauls the most important railroad lines are those joining Poland with the USSR--that is, the Medyka-Krakow-Szczekowa-Silesia line with the Szczakowa-Czesotychowa branch. The second line is the Terespol-Deblin-Kielce-Tunel-Bukowno-Szczakowa line. Of great importance for metallurgy are the railroad lines connecting Silesia with seaports. Among them is the Gdynia-Gdansk-Bydgoszcz-Karsznice-Tarnowskie Gory line with the Sienkowice-Czestochowa branch. The second line con-

necting Silesia with ports is the Szczecin-Poznan-Ostrow-Wlkp.-Tarnowski Gory line or the Szczecin-Wroclaw-Opole-Pyskowice-Gliwice line. The lines listed meet in Silesia.

The acceptance of freight traffic from within the Silesian region and coordination of it with the internal traffic in the Katowice DOKP area takes place through the work of rail junctions located around the region.

The organization of internal traffic is based on the creation of direct trains from the dispatch station to the destination for shipments of coal, coke, limestone, and foundry semi-products.

Hauls by Narrow-Gauge Railroads

Of special nature are the Upper Silesian railroads (Katowice DOKP). The network of these railroads serves the Silesian industry Region (Slaski Okreg Przemyslowy) exclusively (the triangle of cities: Tarnowskie Gory-Gliwice-Szopienice), and first of all the Ministries of Mining, Power, and Metallurgy. They are under PKP administration, although they serve as transport belonging to these ministries.

In supplying iron foundries, they are of great importance because of the size of the mass of materials transported (coal, coke, etc.). Their importance also consists in the fact that certain foundries depend exclusively on narrow-gauge deliveries because the production departments of the foundries are connected only with the narrow-gauge network. This also applies to certain suppliers. The conversion of narrow-gauge railroads to standard-gauge makes it necessary to completely reconstruct the system of foundry sidings, unloading ramps, and foundry stations.

Certain foundries may accept on standard-gauge the deliveries of materials previously carried on narrow-gauge. This applies primarily to the big furnace department to which melts and coke are brought.

The Upper Silesian railroads transport about 50 percent of the total freight mass carried on narrow-gauge railroads and about 3 percent of the standard-gauge hauls. The importance of these railroads for the metallurgical industry is

stressed by the fact that at one time it was planned to place them under the administration of the metallurgical industry. Now that plan has been abandoned.

Out of the total hauls of the Upper Silesian narrow-gauge railroad, 35 percent constitute hauls for iron foundries. The main material transported by this railroad is coal, amounting to 68 percent of the hauls. In nonferrous metallurgy, the hauls by narrow-gauge railroad constitute 80 percent of the total deliveries.

Organization of Hauls on the Upper Silesian Railroad

On the Upper Silesian narrow-gauge railroad there are constant freight flows with uniform daily intensity. The intensity of the flows of freight depends on the rhythm of industrial production and its rhythmical receipt by the foundries. The narrow-gauge railroads constitute a closed circuit. The result of this is:

- a) the possibility of fixing permanent routes for hauls from specific suppliers to recipients and a detailed knowledge of the haulage tasks by carrying freight originating at dispatch stations on the same railroad line;
- b) easier operative regulation and reduction of the quantity of empty rolling stock than is the case on standard-gauge railroads, by not supplying cars for loading for recipients that detain cars in unloading.

However, the difficulties in the organization of hauls on the narrow-gauge railroad consist in the impossibility of supplementing rolling stock from other lines and districts within the framework of available operative rolling stock and in the complete dependence of the state of empty rolling stock on the unloading discipline of recipients of shipments.

The rules on routing do not apply to narrow-gauge railroads, although the obstacle is not that the route tonnage is lower than on standard-gauge railroads. Routing, as the basic principle of organization of hauls, could be successfully used on narrow-gauge railroads, but the different nature of the hauls on narrow-gauge railroads and their technical properties do not permit this practice.

The basic obstacles in the application of routing are as follows:

a) the hauls by narrow-gauge railroads are basically effected directly from shippers to recipients and do not pass through dispatch stations;

b) short hauls do not justify the application of routing.

As on standard-gauge lines, directional planning of hauls should be introduced. The method of planning narrow-gauge hauls has not so far permitted the determination of data necessary for the technical preparation of the work plan of the railroad. The operative plans prepared by the recipients of the service have been to a large extent unrealistic and the setup for forms--taking into account only quarterly planning (with division into months) and giving only the type of freight and freight mass--does not give an exact and clear picture and does not specify the flow of freight.

* * *

Such a considerable planned increase in hauls effected on the same railroad lines, with the absence of construction of new lines and the expansion of foundry and dispatch stations, may lead to a limitation of the planned metallurgical production as a result of the impossibility of supplying the necessary quantities of raw materials and fuel.

The problem of foundry hauls in the GOP requires a complex preparation and immediate decisions concerning urgent PKP investments. We know from practice that all transport investments become considerably delayed.

In connection with the increase in metallurgical production and that of other industries (coal, chemistry), it will become necessary to change and reconstruct the communications system in the GOP if the Silesian industry is to execute its tasks for 1960-1965.

On the initiative of the KW [presumably, Komitet Wojewodzki; Wojewodztwo Committee] in Katowice, a working conference of metal workers and railroad workers was organized, which proposed the creation of an interdepartmental commission to prepare recommendations and make proper suggestions for immediate implementation.

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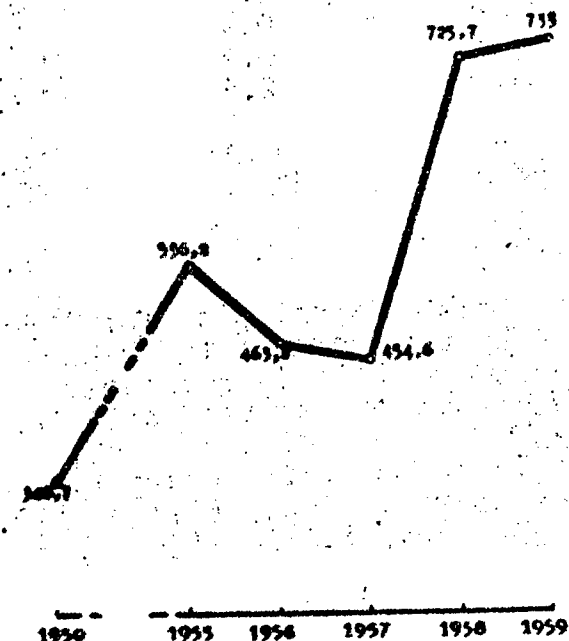
Export of Agricultural Food Products in 1959-1965

[This is a translation of an article by Mieczyslaw Stepinski in Handel Zagraniczny, Vol IV, No 9, September 1959, Warsaw, pages 386-389; CSO: 3496-N]

In order to set the targets for the export of agricultural food products in 1959-1965, it is essential to analyze the present situation in this branch of our economic life. The consumer industry is one of the fundamental branches of our national economy, as is shown by its share in the over-all industrial production (30.8 percent). In regard to the share of the agricultural food industry in exports, the total export value amounted to 4,238 million foreign currency zlotys in 1958, with 760 million zlotys--or almost 19 percent of the total--realized for the export of agricultural food articles. During this period, the export of the agricultural

food industry occupied second place as regards the value of our over-all exports. Development trends in the export of foods (in 1950-1959) produced by plants subordinate to the Department of Food Industry and Purchases and to the Association of Milk Cooperatives is illustrated in the accompanying graph.

In illustrating the share of the various industries in the export of food products, it is worthwhile to compare the figures given below pertaining to the fulfillment of the export plan in 1957, 1958, and 1959.



Export Value of Food Items in
Million Rubles, 1950-1959

The table below shows that the volume of food exports is decided by the meat, egg and poultry, milk, and

sugar industries, which in 1958 jointly accounted for 90.5 percent, and in 1959 which 88 percent of the over-all agricultural food exports. It should be added, however, that the Department of Food Industry and Purchases emphasizes the necessity of expanding export assortments of food articles of plant origin. This export had already increased in 1958 in comparison with the previous year, and further expansion is foreseen.

Industry	Percentage of Plan Fulfillment		
	1957	1958	1959
Meat Industry Center	59.5	51.1	50.7
Grain and Milling Industry Center	1.9	2.5	3.0
Confection Industry Association	0.4	0.4	3.0
Sugar Industry Association	8.4	15.7	10.6
Egg and Poultry Industry Association	17.3	13.5	15.0
Food Concentrates Industry Association	-	0.06	0.6
Fruit and Vegetable Industry Association	0.6	0.5	0.3
"Bacutil" Fodder Industry Association	0.4	0.2	0.2
Brewery Association	1.7	1.0	1.0
Alcohol Industry Association	2.5	1.6	2.0
Tobacco Industry Association	0.4	0.4	1.0
Herb Industry Association	0.5	0.3	0.3
Potato Industry Association	4.0	2.5	3.2
Cold Storage Plants Association	-	0.04	0.1
Branch [total]	97.6	89.8	88.3
Association of Milk Cooperatives	2.4	10.2	11.7

In analyzing the fulfillment of the export plan for 1958, it is also worth noting certain data concerning the recurrence of food deliveries to foreign markets in quarterly periods. Thus, in 1958 the value of exported food articles amounted to 138.8 million foreign exchange zlotys (i.e., 19.1 percent of the annual export) in the first quarter, 195.6 (27 percent) in the second quarter, 142.7 million (19.7 percent) in the third quarter, and 248.5 million (34.2 percent) in the fourth quarter.

Such a shaping of the quarterly export deliveries of food articles is certainly influenced by the campaign industries--for example, the sugar industry (50 percent of the sugar supplies in the fourth quarter), grain and milling (78 percent of the barley supply in the fourth quarter), and potato (54 percent of the potato flour supply in the fourth quarter).

The food industry (excluding the Association of Milk Cooperatives) exported over 14 percent of its entire production in 1958. In regard to the individual industries of this branch, the export share of their production varies considerably. The largest part of the produced commodities is sold for export by the following industries: egg and poultry (42.1 percent), potato (34.3 percent), sugar (31.7 percent), meat (18.7 percent), and alcohol (14.3 percent); the remaining industries contribute very little for export. In the future, these industries will participate in export to a much greater extent: the fruit and vegetable, grain and milling, brewery (export of malt), food concentrate, and some other industries have substantial reserves and possibilities of expanding their export production considerably.

The direction of our food exports in 1958 are illustrated in the table below. (in million foreign exchange zlotys):

	People's Demo- cracies	Western Europe	USA	Others
Meat Industry Center	40.9	237.8	75.8	2.9
Grain & Milling Industry Center	0.2	17.7	-	-
Confection Industry Association	-	0.6	0.07	0.7
Sugar Industry Association	51.1	39.8	0.1	9.5
Egg & Poultry Industry Assn.	6.3	86.6	1.6	3.8
Food Concentrates Industry Assn	-	0.08	0.03	-
Fruit & Vegetable Indust. Assn	1.3	1.4	0.1	0.9
"Bacutil" Fodder Industry Assn	-	1.5	0.3	-
Brewery Association	0.1	3.5	1.2	1.8
Alcohol Industry Association	0.2	9.8	0.1	0.7
Tobacco Industry Association	-	1.3	3.3	0.3
Herb Industry Association	0.04	1.4	0.6	-
Potato Industry Association	-	16.9	-	1.1
Cold Storage Plants Assn	-	0.1	0.03	-
Assn of Milk Cooperatives	19.3	46.5	5.2	1.8
Total	119.4	465.0	88.4	23.6
Percentual share of main exports	17.7	66.8	12.7	3.4

The chief customers for Polish food products are the West European countries (approximately 67 percent) and the people's democracies (over 17 percent)--particularly Czechoslovakia and East Germany. It should be stressed that another big importer is the United States (13 percent), to which we export hams, casein, and certain branches of canned meat and vegetable-meat products. Great Britain is among the larger customers for our food articles, annually importing from Poland some 49,000 tons of bacon and also canned hams, canned meats, a variety of sausages, butter, eggs, potato flour, syrup, confections, food concentrates, and certain vegetable and fruit products.

Livestock and split carcasses are sold mainly to West Germany, France, Austria, Yugoslavia, Italy, Czechoslovakia, Belgium, and Greece. Canned meat and hams are bought--in addition to the United States and Great Britain--by West Germany, Venezuela, Greece, Belgium, the Belgian Congo, Switzerland, Egypt, Morocco, and Finland. Lard is exported chiefly to Czechoslovakia, Rumania, Yugoslavia, Austria (salt pork), and Switzerland. Eggs and poultry are sent to such foreign markets as West Germany, Switzerland, Italy, Austria, Belgium, France, Greece, Czechoslovakia, and East Germany. Polish sugar is exported to many countries, such as Norway, Switzerland, West Germany, Finland, Sweden, Austria, the Sudan, Jordan, Hungary, Rumania, and the Soviet Union. Malt and barley are exported to Brazil, Switzerland, Japan, Spain, Italy, West Germany, France, Belgium, and Finland.

Last year, in spite of keen competition, we succeeded in obtaining relatively favorable prices for such articles as hams, canned products, malt, barley, livestock, bacon, down, sugar, eggs in shell, potato flour, canned meat, potato pulp, dried chicory, dextrine, slaughtered poultry, casein, strawberry pulp, and jams. Less favorable prices were obtained for bulk alcohol, edible and technical lard, potato flakes, and syrup.

By classifying livestock and split carcasses, bones for technical use, cattle horn, barley, buckwheat, beans, and peas as exported raw materials; slaughter product, lard and salt pork, calf stomachs, down, bristles, shelled eggs, casein, lactose, industrial tobacco, roasted chicory, dried chicory, wheat germ, pulps, fermented fruit juices as semifinished products, and all others as finished products, the following export division of agricultural food production is obtained:

	Value in Million Foreign Exchange Zlotys		Percentual Share	
	1957	1958	1957	1958
Finished products	383.8	546.7	84.7	75.3
Semifinished products	43.9	68.6	9.7	9.5
Raw materials	25.6	110.4	5.6	15.2

Thus in 1958, as compared with 1957, a clear shift occurred in the export structure: the volume of finished products decreased while the volume of raw materials simultaneously increased, mainly as a result of a substantial rise in the export of livestock. Considering that raw materials accounted for some 60 percent of our total export in this period, the share of raw materials and semifinished products in the agricultural food export (about 25 percent) may be accepted as proper.

Comparing the development of Poland's agricultural food export with that of other countries, it may be stated that in spite of some improvement we are still lagging behind. For example, the export of agricultural food products in 1955 averaged 156 dollars per capita in Denmark, 78 dollars in Holland, 17 dollars in France, 8 dollars in Italy, and only 4.5 dollars in Poland in 1957. Although in 1958 this index improved considerably (approximately 7 dollars), it should not be forgotten that the above named countries continue the work of further expanding their agricultural food export, and that we must substantially develop our export production if we want to match them. Our perspective plan for 1959-1965 moves in this direction, anticipating a sizable increase in the export of agricultural food products in all branches of the food industry (with the exception of the fodder industry).

The years 1956-1960 show a strong increase in the export of articles of animal origin, with a parallel stabilization (and even some decrease) of the export of plant products. Although the plan for 1961-1965 provides for a further expansion of the export of animal products, it also emphasizes a fuller utilization of reserves in the export production of plant products. In 1965 animal products will account for two-thirds of the value of export production and plant products for only one-third. This means a definite speed-up in the development of export of food articles derived from plants in relation to the preceding period.

It should be added that the production of articles of animal origin and of plant products is closely connected. These industries influence each other. The output of animal products affords the best possibilities of intensifying agricultural production. On the other hand, animal products have a better chance of being sold abroad at favorable prices, which explains the guide-lines of the perspective plan setting forth that these articles will make up two-thirds of the agricultural food export.

In 1955-1960 the export was concentrated on four main branches of the food industry (in the first place, the meat industry). The participation of the remaining branches has shown an obvious declining tendency (12.7 percent in 1955 and 10.4 percent in 1960). It is foreseen, however, that in 1961-1965 the share of these branches will increase to 16 percent of the food export value. This is tantamount to a broadening of the assortment of exported products (mainly in the confection, fruit-vegetable, brewery and malt, and food concentrates branches). The plan aims at an introduction of a more elastic and proper export policy, at the same time creating conditions for the utilization of reserves inherent in plant production.

The perspective plan anticipates a very considerable expansion of agricultural food export. While in 1955 the value of this export amounted to 564 million foreign exchange zlotys, the plan for 1960 anticipates an increase up to 870 million, with a volume valued at 1,250 million for 1965. The share of food articles and raw materials in our total export is to rise from 15.2 percent in 1955 to 21.1 percent in 1965. In the common pool of exported agricultural food products, a principal role (approximately 90 percent of the total value) will be played by commodities produced in establishments under the Ministry of Food Industry and Purchases (Ministerstwo Przemyslu Spozywczego i Skupu) jointly with the Association of Milk Cooperatives (Zwiazek Spoldzielni Mleczarskich). The perspective plan also stresses exports by other producers, such as the ZSS [Zwiazek Spoldzielni Spozywczych; Association of Consumer Cooperatives] in Spolem, garden cooperatives, village cooperatives, etc. Their participation in food exports should increase from 5 percent in 1955 to 13.6 percent in 1965. The principal export items will be edible potatoes, fresh fruits, fresh vegetables, onions, poppy seeds, fish and fish products, berries, and mushrooms.

In addition to the general development principles of agricultural food exports, it is worthwhile to quote some figures relating to its quantitative and qualitative expansion in the main branches of the agricultural food industry in 1960-1965.

In the meat industry, the export value is to rise from 407 million foreign exchange zlotys in 1960 to 462 million in 1965. The bacon export should remain unchanged (49,000 tons annually), but the export of canned hams and pork shoulders is to increase (by 32 percent in 1965 as compared with 1960). It is expected that the export of canned meats will also rise (by 30 percent in 1965 as compared with 1960). The export of lard and salt pork does not show any expansion trend, remaining at the 1958 level in 1965. Foreign sales of livestock and split carcasses are to rise slightly, by 12 percent in 1965 as compared with 1958. However, a further development is anticipated in the export of cold cuts, which will double in 1965 as compared with 1959. The export of slaughter products will not show any particularly strong development tendencies.

The export value of egg and poultry articles is to rise to 230 million foreign exchange zlotys in 1965 (the plan for 1959, 125 million). Foreign egg sales will double the anticipated achievements of the 1959 plan. Poultry exports will increase by approximately 40 percent in relation to 1960. Exports of down, powdered eggs, shelled eggs, and canned poultry will also rise.

The present development of the milk industry indicates that in the coming years we may obtain a volume of products not only satisfying the domestic requirements but allowing substantial surpluses for export. This export has been developing favorably since 1958. According to the plan, by 1965 it will reach the value of approximately 108 million foreign exchange zlotys. It is anticipated here that exports will amount to more than 30,000 tons of butter, 13,000 tons of casein, 6,000 tons of hard cheeses, and 3,600 tons of curds, with exports of refined lactose, cottage cheese, powdered and condensed milk also increasing. The export of canned milk products depends on the expansion of the existing production plants and an increase in their productivity.

The planned development of sugar beet cultivation, as well as the expansion and modernization of the sugar industry, will allow an increase in sugar export (95 million foreign exchange zlotys in 1960, 170 million in 1965).

In regard to the brewing industry, the plan for 1965 calls for a fourfold increase in malt export as compared with 1959, and a further expansion of the beer and hop export. The latter item depends on an increase in the cultivated acreage and the per hectare productivity. The export value of brewery products is to exceed 20 million foreign exchange zlotys in 1965. The export of brewer's barley, peas, beans, etc. will also rise.

The export of neat and quality vodkas is to amount to 600,000 liters in 1960 (computed in terms of pure alcohol) and 1,200,000 liters in 1965. As of 1960, bulk alcohol will no longer be exported, because this export is unprofitable and the raw material should be assigned for other industrial purposes.

Although the Polish tobacco industry still has no sizable export surpluses, the perspective plan calls for an increase in tobacco export (2,100 tons in 1960; 4,000 tons in 1965). This depends on the further expansion of the cultivation area and on the growing of more high-quality varieties.

In accordance with the directives of the perspective plan, the export of potato industry products should bring at least 24 million foreign exchange zlotys in 1965. The herb industry anticipates that the export value of herbs and attars will amount to over 4,500,000 foreign exchange zlotys in 1965. Initiated in 1958, on a trial basis, the export of frozen fruits and vegetables should gross some 7,500,000 foreign exchange zlotys (6,000 tons) in 1965. The confection industry, which has been developing foreign sales of candies, chocolates, cakes, and the so-called "oriental" products for several years, anticipates a large increase in exports--over 4 million foreign exchange zlotys in 1960 and 12 million value in 1965. Finally, the "Bacutil" Association of Fodder Industry is expected to continue the export development of processed and bedding bristles (105 tons in 1960 and 130 tons in 1965). The perspective plan entirely eliminates the import of preserved gelatin (in connection with the opening of a domestic gelatin factory) but anticipates a rise in the export of photographic gelatin and a start in exporting preserved gelatins. In 1965 this export is to achieve the value of 2 million foreign exchange zlotys.

To fulfill these ambitious export plans, an expansion of the existing and the construction of new food industry plants is necessary. The departmental investment plan foresees a

large development of factories, particularly in the meat and egg and poultry industries, with a strong emphasis on mechanization and automation, as well as an expansion of cold storage facilities attached to the plants. Other food industries also plan factory expansion and productivity increases within their development programs, to meet domestic needs and the ever-growing export targets.

Investments planned in the food industry could not alone solve all problems of export production, especially the packaging problem. Therefore, large investments are planned in the polygraphic, chemical, and glass industries, as well as in tin-plating, wood and paper packaging industries. Previous inadequate investments in these industries seriously influences the export development of food articles. Esthetic, durable, and attractive packaging of our exported food articles assumes priority in view of the growing competition on foreign markets. Both the food industry and the cooperating branches will have to concentrate their efforts on the packaging problem if they want to satisfy the demands of our foreign customers.

An equally important problem is the need for wide advertising and propaganda of our products on foreign markets. Participation in international fairs and exhibitions is one of the most effective means of advertising. It should be stressed that the food industry is developing an ever more lively activity in this field. In 1959, in addition to the International Fair in Poznan, the industry participates in 14 international events (International, Spring, and Fall Leipzig Fairs, the Frankfurt Fair, where articles of plant origin are stressed, Milan, Casablanca, Paris, New York, Barcelona, Chicago, Vienna, Salonica, the Food Exhibition in Manchester, the International Food Fair in Cologne, and the Polish Industrial Exhibition in Moscow). This wide participation in international exhibitions will certainly contribute to a more vigorous food export activity and to the strengthening of our position on foreign markets.

POLAND

Polish Exports of Potatoes and Potato Products

[This is a translation of an article by Edward Chomicki in Handel Zagraniczny, Vol IV, No 10, October 1959, Warsaw, pages 435-438; CSO: 3497-N]

Potatoes and potato products are at present one of the most important items in the export group of agricultural consumer articles of plant origin. The assortment range consists of edible, industrial, and seed potatoes, as well as such products as potato flour, alcohol, syrup, dextrin, potato flakes, and pulp. These products are our traditional exports, well known on many foreign markets.

Potato growing in our country is one of the basic branches of agriculture and has special significance. Potatoes play a large part in feeding the population and supply basic fodder--of great importance to the entire livestock economy--for hogs and cattle. In addition, potatoes are a valuable raw material for the domestic processing industry. One of their products, alcohol, has wide application in the production of lacquer, drugs, cosmetic articles, etc. A benzine mixture is produced from waterless potato alcohol. Such products as potato flour, glucose, caramel, artificial honey, and vegetable glues are useful not only in private homes but also serve as valuable semi-products widely utilized in the chemical, textile, and paper industries. Valuable cattle fodder is a by-product of industrial potato processing. Here are a few examples illustrating the wide utilization of potatoes and their importance for the economy of the country.

Poland occupies one of the foremost places in the world as a potato grower, thanks to exceptionally favorable conditions (geographic location, climate, soil conditions, tradition of cultivation, etc.). Between the wars Poland was third in world production, after the Soviet Union and Germany, regarding the cultivated area and the size of the crop. At present we are only behind the USSR but have priority in per capita production (the yearly average amounted to 1,025 kilograms in 1934-1938 and to approximately 1,200 kilograms

in 1950-1956). Figures on potato production in Poland in relation to world production (excluding the USSR) and a comparison of production in certain countries with the Polish output are given in the table below.¹

I = Amount
II = Percentage, compared with Polish production

	Cultivated Area in 1,000 Hectares					
	1934-1938 ^b		1948-1952		1 9 5 6	
	I	II	I	II	I	II
World production (excluding USSR) ^a	13,600		12,800		12,800	
Poland	2,899	21.3*	2,571	20.1*	2,713	21.2*
Czechoslovakia	715	24.2	623	24.2	630	23.2
East Germany	786	27.1	818	31.8	810	29.8
West Germany	1,182	40.8	1,136	44.2	1,135	41.8
Great Britain	296	10.2	496	19.3	373	13.7
France	1,524	52.5	1,124	43.7	1,059	39.0
Italy ^c	402	13.9	392	15.2	387	14.3
The Netherlands	144	5.0	186	7.2	144	5.3
Belgium	158	5.4	90	3.5	86	3.2
Finland	74	2.5	95	3.7	93	3.4
Denmark	79	2.7	113	4.4	96	3.5
Switzerland	47	1.6	57	2.2	60	2.2
	C r o p s		i n		t o n s	
	1934-1938 ^b		1948-1952		1 9 5 6	
	I	II	I	II	I	II
World Production (excluding USSR) ^a	159,300		159,000		184,400	
Poland	35,007	22.0*	29,641	18.6*	38,052	20.7*
Czechoslovakia	9,635	27.5	7,055	23.8	9,635	25.3
East Germany	13,567	38.7	13,174	44.4	14,529	33.2
West Germany	19,603	56.0	24,067	81.2	26,756	70.3
Great Britain	5,011	14.3	9,444	31.9	7,654	20.1
France	17,158	49.0	13,734	46.3	18,169	47.7
Italy ^c	2,716 ^c	7.7	2,732	9.2	3,418	9.0
The Netherlands	2,825	8.1	4,679	15.8	3,402	8.9
Belgium	3,169	9.0	2,127	7.2	2,034	5.3
Finland	1,105	3.1	1,442	4.9	1,693	4.4
Denmark	1,349	3.8	2,170	7.3	2,140	5.6
Switzerland	736	2.1	1,039	3.5	1,500	3.9

*Percent of world production

^a1956 potato-growing area in the USSR: 9,197,000 hectares

^bFor 1934-1938 and 1948-1952 periods, annual averages

^cAnnual averages for Italy in 1936-1939

During the first years after World War II, potato production in Poland declined considerably as a result of temporary difficulties caused by military hostilities (in 1946, for example, it amounted to only half the average prewar crop). During 1947-1949, the average annual crop amounted to 29,492,000 tons; 1950 was a year of clear improvement--36,130,000 tons. However, 1951 and 1952 brought a serious decline--26,696,000 and 27,725,000 tons. The 1953 crop was somewhat better--31,800,000 tons, and that of 1954 still better--35,662,000 tons. The 1955 crop was low--27,021,000 tons. After the record crop of 1956--38,052,000 tons--the succeeding years showed a declining tendency--35,104,000 tons in 1957 and even less in 1958. The average annual potato crop in Poland during 1950-1957 amounted to 32,270,000 tons, which, in comparison with the 1934-1938 average, showed an increase of 92.2 percent, with an even better average annual per capita production index.

The potato-growing area in Poland is, as in the prewar period, the second largest after rye. It amounted to 2,538,300 hectares or 17.2 percent of the total arable land in 1949, 2,702,400 hectares (17.6 percent) in 1955, and 2,763,300 hectares (17.8 percent) in 1957.²

These figures show that Poland has a huge potato production base and is able to fully satisfy the needs of domestic consumers and the processing industry and is also striving to maintain its place among the leading world exporters of these products.

What was the state of our potato and potato products export? In other words, how was this tremendous raw material base utilized for the purposes of international exchange?³

Between the wars, the export of edible potatoes and products was relatively small. The average annual potato export amounted to approximately 40,000 tons, and the export of potato products had little significance within the overall Polish foreign trade turnover, in view of the low degree of development of the domestic processing industry.

Export deliveries of potato flour amounted to about 20.2 percent of the domestic production (4,700 tons) in 1934 and approximately 25 percent (7,902 tons) in 1937. Potato syrup was not an export item, as indicated in the available documentation of GUS [Główny Urząd Statystyczny; Main Statistical Administration]. In 1937, 2,166 tons of dextrin were exported.

Export deliveries of potato flakes fluctuated between 2,530 and 8,122 tons in 1934-1937. In 1937, 707 tons of potato pulp were also sold abroad. The above amounts of potatoes and products calculated as raw material equal about 150,000 tons of potatoes (in their natural form), which is only 0.44 percent of the 1934-1938 average annual crop.

The share of these exports in the over-all value of products of plant and animal origin sold abroad in 1937 approximated 0.25 percent. According to average comparable 1957 prices, the value of these exports amounted to approximately two million dollars (postwar). Our renewed postwar export of potatoes and products has every chance for successful development, as has already been proved by the present achievements. The table below illustrates the general outlines of the export of potatoes and potato products in 1950-1958.

	Exports in Tons				
	Fresh Potatoes, Edible & Industrial	Potato Flour	Potato Syrup	Dextrin	Potato Flakes
1950	18,500	24,900	1,681	633	5,485
1951	-	34,200	3,838	3,006	2,752
1952	-	22,500	209	1,064	-
1953	950	12,700	1,027	1,063	-
1954	32,800	46,600	232	1,503	500
1955	14,900	56,200	3,542	911	1,462
1956	27,500	34,400	4,045	1,370	20
1957	49,300	34,200	3,779	1,412	1,099
1958	83,300	33,600	7,210	1,107	3,173

The above figures show rather large fluctuations in potato exports until at least 1957, when the exports rose to the prewar level; 1958 brought about a further improvement.

The over-all exports of potato products decidedly exceeds the prewar figures, with potato flour occupying a key position (the annual average of 1950-1955 constitutes 511.3 percent of the 1934-1937 annual average, and 530.2 percent of the last three years, in relation to the same prewar period). It should be added that the domestic production of potato flour was also greatly increased after the war. Potato syrup was not even listed in the available prewar foreign trade statistics. In the postwar period (despite considerable fluctuations in various years) the item gradually assumed a grow-

ing importance. The export of dextrin, however, did not reach the prewar level, with the exception of 1951. Also unfavorable was the export of potato flakes, which showed substantial fluctuations in quantity. Potato pulp did not appear on the export lists of our foreign trade until 1955. The average annual exports of this product in 1953-1955 doubled the quantity of pulp sold abroad in 1937, in spite of some fluctuations in the quantity. In 1956-1958 the ratio was even more favorable--exports more than tripled.

The average yearly foreign currency earnings from these exports in 1950-1955 amounted to approximately 4.5 million dollars (prices on fob basis), and 5.5 million dollars per annum in the last three years.

The following quantities of the total domestic production were assigned for export purposes (including, for informative calculations, the production of potatoes and potato products but not pulp): approximately 305,000 tons or about 0.94 percent in 1951; approximately 450,000 tons (1.4 percent) in 1955; and approximately 334,000 tons (1.3 percent) in 1957.⁵

It should be added that, in regard to the geographic direction of these exports, the foreign markets are attractive, paying for the most part in hard foreign currencies for our deliveries of potatoes and products and thus assuring foreign currency reserves for our imports of many valuable raw materials, machinery, and equipment of high efficiency.

Accepting the total value of the potato and potato products export in each individual year as 100, we shall obtain the following figures illustrating the percentual share of various countries in transactions negotiated in 1951, 1953, 1957, and 1958.

1951: Deliveries were directed to 22 countries, including Great Britain, 38.7 percent; West Germany, 22.6 percent; Finland, 10.6 percent; Switzerland, 7.6 percent; and such other countries as France, Belgium, Italy, the Netherlands, Egypt, Iceland, Lebanon, Jordan, India, Denmark, Pakistan, Israel, Syria, Turkey, South Africa, Hong Kong, Peru, and the Chinese People's Republic.

1953: The export range extended to 23 countries, including 28.4 percent to Great Britain, 18.1 percent to East Germany, 15.7 percent to Finland, 9.6 percent to West Germany, 9.0 per-

cent to Belgium, and smaller amounts to Switzerland, France, Italy, Czechoslovakia, Egypt, Iceland, Israel, Pakistan, Jordan, Syria, Turkey, South Africa, Austria, Greece, Rumania, Sweden, Brazil, and Mexico.

1957: Exports went to 21 foreign markets, including 35.8 percent to Great Britain, 26.3 percent to West Germany, 11.9 percent to Belgium, 7.2 percent to East Germany, as well as Italy, Switzerland, Turkey, South Africa, Jordan, Egypt, Iceland, China, Mexico, Greece, Sweden, Israel, Austria, Lebanon, Syria, Pakistan, and the Netherlands.

In 1958 there was not only a rise in the total quantity of exported commodities but also a substantial expansion of foreign markets up to 26 countries, including 31.4 percent to Great Britain, 18.3 percent to France, 17.6 percent to West Germany, 9.4 percent to Belgium, 5.8 percent to Switzerland, as well as Algeria, Morocco, Finland, Italy, the Netherlands, and a number of lesser recipients.

It is worth noting that in 1958, for example, potato flour was delivered to 14 countries (seven in 1937), of which Great Britain bought 30.7 percent, West Germany 24.1 percent, Belgium 17.2 percent, Switzerland 12.8 percent, while smaller quantities were sent to France, Italy, Peru, Hong Kong, Finland, Israel, Egypt, Uruguay, Pakistan, and Greece.

In the same year, exports of potato syrup were mainly concentrated on the British market (95 percent), with Jordan, Iceland, the Sudan, and Syria buying the balance.

Eight countries participated in the purchase of dextrin, of which Egypt bought 45.1 percent, Spain 36.1 percent, Turkey 9.7 percent, and smaller amounts were sent to West Germany, Belgium, Israel, Morocco, and Vietnam.

Potato flakes and pulp were delivered to two countries: 76 percent to Belgium and 24 percent to Great Britain.

Industrial and edible potatoes found markets in eight countries: France 41.3 percent, West Germany 29.4 percent, smaller quantities in Algeria, Great Britain, Morocco, the Netherlands, Finland, and Sweden.

In quoting the above data, one should remember that 1958 was a year of exceptional opportunity. The capitalist countries of Northern and Central Europe suffered a substan-

tial production decline in relation to 1957, which not only resulted in an increased number of buyers but also permitted the favorable prices to be maintained.

Comparing the last nine years in our export of potatoes and potato products with the period between the wars, it should be stated that we achieved much in this field. The total value of exports in the six-year period more than doubled and almost tripled in the last three years, as compared to 1937. Thus, the raw material base was better utilized for the purposes of international exchange, particularly in processing, where, for example, the average annual export of potato flour in 1950-1959 rose to more than five times that of 1934-1937, with a simultaneous increase in the number of attractive foreign markets.

However, this unquestionable achievement cannot conceal the fact that Poland, a leading potato producer, still supplies too little of this produce to the foreign markets.

The Netherlands, for instance--a country almost one-tenth the size of Poland--exported on the average approximately 500,000 tons per year of potatoes in 1949-1954, or more than 10 percent of the average annual 1948-1952 crop (potato products are presumably not included in this amount).⁶ Our export possibilities, taking into account the basic requirements of our foreign clients concerning quality, variety, standards, execution of deliveries in suitable seasons, etc., greatly exceed the results achieved. Why then are these possibilities not fully exploited?

The reason is the shortage of the product. One may agree with the statement that our per capital consumption is the highest in the world (and therefore a huge quantity of potatoes must be set aside for domestic consumption). It may also be accepted that the expanding livestock economy increases the fodder requirements. These arguments, however, do not exhaust the entire problem. As is generally known, it is the raw material base which determines the degree to which domestic and export requirements are fulfilled. It is also known that we do possess this basic factor and are in this regard in a much better situation than the majority of countries. But precisely in this field there are tremendous unexploited reserves, and this is the reason for our difficulties. Two sources of unused reserves, quoted below, should adequately prove the point.

One basic task facing our agriculture is that of raising the per hectare productivity as soon as possible to the level of countries leading in this respect. We cannot increase our area under cultivation. The area of arable land does not expand and may even shrink to some degree with the construction of large industrial centers, towns, and settlements (for example, Nowa Huta, Warsaw Roundry, Nowe Tychy, etc.). For several years now, the potato crop has been maintained more or less on the same level. We are outdistanced here by almost every other country. A simple computation will best illustrate the importance for the national economy of a per hectare rise in crops: if it were possible in 1956, for example, to obtain in Poland--on the same potato-growing area--an average per hectare yield on the Czechoslovak and East German level (together), or approximately 16.6 tons, then the potato crop would increase by about 7 million tons, or by almost the entire production of Great Britain. These 7 million tons of potatoes, translated into hard currency, would earn about 10.5 million dollars.

The second example proving the existence of reserves is the amount of production losses. At present, this situation has probably improved; still, it is useful to quote the 1954 figures. In an article by Wl. Kozak, entitled "Production Losses in Agriculture Should and Can Be Decreased" (Gospodarka Planowa, No 5, 1956), one reads the following: "Harvesting losses due to undug potatoes were estimated in 1954 for the entire agriculture, according to data pertaining to potato digging control, at approximately 2.5 million tons, or about 7 percent of the annual crop. In addition, potato storage losses resulting from blemishes, freezing, etc. are estimated at 12 percent, which is an approximate annual average of 3.6 million tons. Jointly, the amount of production losses in gathering and storing potatoes totals 6 million tons per year. These potato losses in crops already gathered point realistically to a tremendous production reserve, the lowering of which to a level of permissible natural waste (setting the amount of natural potato waste, in accordance with existing regulations, at 8 percent during the season) would leave about 3.5 million tons for production purposes. This would allow the additional feeding and fattening of approximately 3.5 million hogs.

Any comments here are superfluous. It may only be added that the above number of hogs calculated in the weight of meat for export would earn about 168 million dollars.

Apart from a correct development of the raw material base, another essential factor in activating exports is the processing capacity (in numbers and in time) of the domestic potato industry. Here the situation is also unfavorable. A multifold increase in the production of potato flour, for example, in relation to the prewar period, represents a concrete achievement. However, a closer analysis will show that the rise in the processing capacity of the establishments resulted solely from the inclusion of the processing plants in the Western Territories. The indispensable renovation and modernization of machinery has not been undertaken in this industry for several years. Added investments and expansion of plants producing potato flour, particularly in regions where the production of raw material is concentrated, was and still is most necessary. In previous years, however, a different solution was attempted in view of limited investment possibilities--an extension of the production campaign into the spring season. This did not solve all the difficulties. The deficit in potato flour production was reduced to a certain degree, but decided unfavorable phenomena appeared simultaneously. The time period of preparing machines and equipment for the basic campaign in the fall was greatly shortened by extending the potato campaign into the spring. The economic effects of potato production also deteriorated. The starch content of potatoes--one of the decisive factors in the economic effectiveness of processing--depends on many things, but it is highest in the fall. For natural reasons, the starch content of potatoes declines considerably in the spring.

Another example of the difficulties encountered by the processing industry is the production of dextrin.. Although this article is sought on foreign markets, the export of yellow dextrin had to be discontinued as of 1958 owing to an over-exploitation of the machinery. It should be mentioned here that both the industry and the exporters demanded the importation of certain indispensable equipment (such as vats for acetifying and scalding and humidifying equipment, etc.). For a relatively small amount of hard currency, such imports would permit the producing during a single fall campaign of exportable goods, compensating for 50 percent of the above investment outlays, plus a large increase in the export of dextrin in subsequent years.⁷

The difficulties of the processing industry and the negative aspects of spring potato campaigns brought about new ideas concerning the structure of the export of potatoes and

their products: a decrease in the export of potato products with a simultaneous suitable increase in the export of edible potatoes (at the rate of one ton of potato flour equaling 7 tons of edible potatoes). This idea is acceptable with some reservations. First, this cannot be the "ultimate" solution but only a temporary one, and it should not obscure the necessity of expanding and modernizing the processing industry. Second, it should be considered that the processing industry uses unsorted raw materials (various kinds of potatoes, mechanically damaged, etc.). Export deliveries of edible potatoes must satisfy the requirements of the foreign buyers in regard to their variety, quality, and delivery deadlines. Therefore, the deliveries should be handled by units subordinate to the Department of Agriculture within their normal export activity, and not by the industry.

Investments necessary to the expansion of the potato industry were already discussed by the Agriculture and Consumer Industry Committee of the Sejm [Parliament]. Deputy Stuczynski expressed his anxiety during the debate¹ that the investment needs of the potato industry have not been adequately treated in the consumer industry development plan for 1959-1965. This may cause serious difficulties in the future, in view of the planned increase of 30 quintals per hectare in potato yields. Raising the raw material base without adequate investments in the industry may create a situation in which the industrial plants will not be able to process the increased amounts of raw material.

As shown in this necessarily fragmentary review, the importance of the export problems discussed here should not be minimized. The five-year foreign trade plan for 1959-1965 anticipates that exports of potatoes and potato products will reach the value of approximately 12.5 million dollars (on the basis of 1958 price levels), or 77 percent more than in 1958, and that the fulfillment of the plan will permit Poland to take her deserved place among the leading producer-exporters of this commodity.

Footnotes

¹Figures from the Statistical Yearbook of GUS, 1958, Table 49, page 534.

²See above, figures as of June.

³The problem of exporting seed potatoes, omitted in this article, has been dealt with previously in the monthly Handel Zagraniczny, No 7, 1958, in an article by E. Chomicki entitled "Increasing the Export of Qualified Seed Potatoes." Also omitted is the export of alcohol, as this subject would require separate extensive treatment.

⁴Figures for 1950-1957 according to the Ministry of Foreign Trade; for 1958, according to GUS "Foreign Trade Statistics," June, 1959.

⁵The indices of the percentual share are calculated in relation to average annual potato crops in 1950-1957 (32,270,000 tons).

⁶According to Rynki Zagraniczne, No 73, June 1959, during the current season the Netherlands exported 60,900 tons of early potatoes to England. (who imported 370,372 tons from Western Europe alone), Belgium 128,700 tons, and Denmark 80,000 tons. It should be noted that early potato crops are as a rule smaller per hectare. However, as is proved by the size of deliveries in this period, this export must be profitable to the suppliers.

⁷According to the Potato CZP [Centralny Zarzad Przemyslu Ziemniaczanego; Central Board of Potato Industry], over 2,000 tons per year.

⁸Trybuna Ludu of 11 April 1959.

- END -

FOR REASONS OF SPEED AND ECONOMY
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